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| **Theme Overview** |
| **Lead Subjects** | **Additional Subjects** | **English** |
| * Science
* Geography
* History
* Art and Design
 | * Computing
* Mathematics
* Music
 | * Stories with a Theme
* Poems with a Structure
* Information Booklets
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| **Visits** | **Visitors** | **Experiences** | **Events** |
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| **Getting Started…** |
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| **Be Curious** |  | **Be Knowledgeable** |  | **Be Adventurous** |  | **Be Ambitious** |  | **Be Creative** |  | **Be Collaborative** |  | **Be Reflective** |  | **Be Positive** |
| * Engage in first-hand experiences
* Embrace experiences which are remarkable to the individual
* Invoke a sense of awe and wonder
* Develop an appreciation of and responsibility for the environment
* Engage in multi -sensory learning
* Experience contrasts (polluted/unspoilt, light/dark, urban/rural, loud/quiet)
 |  | * Secure strong Literacy/Numeracy Skills
* Develop subject specific language
* Manage, receive, record and apply information
* Nurture a thirst for knowledge
* Apply cross -curricular skills
* Develop Information processing skills
 |  | * Work within one's own comfort zone and outside it
* Work in the real world with first-hand experiences
* Work practically
* Work on a large scale
* Experience exhilaration, challenge and achievement
* Develop problem-solving skills
 |  | * Develop responsibility for one's own learning
* Link with experts
* See possibilities
* Strive for improvement
* Seek opportunities
* Develop an open outlook
* Develop a 'Growth Mindset'
* Develop relevant attributes of learning
 |  | * Choose how to use free time
* Developing hobbies and interests
* Apply skills to new situations
* Explore alternatives in problem solving situations
* Question 'What if...?' 'Why not....?', etc.
* Develop creative thinking skills
 |  | * Work with others in an interactive learning process
* Respect the opinions and differences of others
* Value one's own perceptions and those of others
* Challenging one's own perceptions and those of others
* Work as a team
* Develop empathy
* Develop social skills
 |  | * Make lifestyle choices in response to thoughts
* Identify and use one's aptitudes and interests as a vehicle for learning
* Move towards the understanding of a wide range of feelings (success/failure, apprehension, anticipation)
* Develop awareness of individual strengths and areas of development
* Develop reasoning skills
 |  | * Listen and respond to advice
* Value pupil voice
* Develop self-esteem
* Be listened to
* Manage one's own behaviour
* Develop own opinions
* Secure and articulate preferences
* Consider one's place in the world
* Foster intrinsic motivation
* Develop relevant attributes of learning
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| **Science** |
| **Key Learning** |
| **Material Properties and Changes - States of Matter*** Compare and group materials together, according to whether they are solids, liquids or gases.
* Solids, liquids and gases can be identified by their observable properties.
* Solids have a fixed size and shape (the size and shape can be changed but it remains the same after the action).
* Liquids can pour and take the shape of the container in which they are put.
* Liquids form a pool not a pile.
* Solids in the form of powders can pour as if they were liquids but make a pile not a pool.
* Gases fill the container in which they are put.
* Gases escape from an unsealed container.
* Gases can be made smaller by squeezing/pressure.
* Liquids and gases can flow.

***Notes and Guidance (Non-statutory)**** *Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas*

**Pupils Might Work Scientifically*** By grouping and classifying a variety of different materials.
* By exploring the effect of temperature on water and ice.
* By researching the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid.
* By observing and recording evaporation over a period of time, such as a puddle in the playground or washing on a line.
* By investigating the effect of temperature on washing drying or snowmen melting.

This unit provides an ideal opportunity for using data logging equipment to detect/measure and compare temperatures. |

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| **Science** |
| **Creative Learning Opportunities and Outcomes** |
| **Resources*** There are a number of websites containing resources to support collaborative learning and enhance the understanding of the properties of solids, liquids and gases.
* Collaborative Learning website ([here](http://www.collaborativelearning.org/sciencechemistryonline.html)): In particular, States of matter ([here](http://www.collaborativelearning.org/statesofmatter.pdf)); Drop of water ([here](http://www.collaborativelearning.org/dropofwater.pdf)); Changing states ([here](http://www.collaborativelearning.org/changingstates.pdf)). The latter is useful as a mini assessment task.
* SGSTS website ([here](https://www.sgsts.org.uk/SupportForVulnerablePupils/EMTAS/SitePages/Science.aspx)): [In](https://www.sgsts.org.uk/SupportForVulnerablePupils/EMTAS/SitePages/Science.aspx) particular, Liquids and solids statements ([here](https://www.sgsts.org.uk/SupportForVulnerablePupils/EMTAS/Shared%20Documents/Liquids%20and%20Solids%20Statements.pdf)) a true or false statement game which links to ‘How will you find out?’ below; A day in the life of a gas particle ([here](https://www.sgsts.org.uk/SupportForVulnerablePupils/EMTAS/Shared%20Documents/A%20day%20in%20the%20life%20of%20a%20gas%20particle.pdf)).
* Teachers Media website ([here](http://www.teachers-media.com/videos/honesty-lateral-thinking-and-other-topics)). A short video clip (watch from 2:00 - 3:40) encouraging children to use their creative thinking to come up with ideas for different uses of balloons.
* APBI website ([here](http://www.abpischools.org.uk/page/modules/solids-liquids-gases/slg2.cfm)) which gives brief cartoon animations to support explanations of properties of solids, liquids and gases. The website also has a resource library ([here](http://www.abpischools.org.uk/page/resourcelibrary.cfm)) which has other useful information (accessed by searching **age range** 7-11; **subject**: science; **topic**: solids, liquids, gases).
* BBC Bitesize website which has a variety of short video clips relating to changing materials ([here](http://www.bbc.co.uk/education/topics/zcvv4wx)) look for changing state, water cycle and melting titles, and solids, liquids and gases ([here](http://www.bbc.co.uk/education/topics/zkgg87h)).
* The Met Office website ([here](http://www.metoffice.gov.uk/education/)) for water cycle resources.
* Teachers Media website ([here](http://www.teachersmedia.co.uk/videos/what-stuff-does)) has several short clips including ‘Melting moments’ (8:39-9:24) and ‘Rainy days’ (9:27-11:57) about how water changes and the water cycle.
* Teachers Media website ([here](http://www.teachersmedia.co.uk/videos/evaporation-and-condensation-robinson-crusoe-makes-drinking-water)) which has a short video clip showing how a castaway makes drinking water from sea water.

**Real outcome*** Children will produce a booklet about solids, liquids and gases that can be presented to Year Six to aid their revision of the big ideas in science. Each lesson, children will present their findings and the facts about solids, liquids and gases through images and text. They should remember to use scientific vocabulary throughout the booklet. *(Note: Not all lessons will form part of the booklet as some lessons are based on gathering children’s own ideas and others are collecting evidence of the facts. Only record the facts in the booklet. This can act as a summary of their learning so far throughout the activities).*

**Wow launch*** Custard or cornflour slime: Challenge the children by asking them ‘Is custard or cornflour a solid, liquid or gas?
* Make cornflour slime (the Science Museum website ([here](http://www.sciencemuseum.org.uk/~/media/Documents/launchpad_activities/cornflour_slime.ashx)) has a recipe) and allow children to explore the slime with their hands. They should try rolling the slime in their hands – they can roll it into a ball like a solid but if they stop moving it in the centre of their palm it behaves like a liquid. They should then also try putting their hand in the saucer of slime really quickly – it is solid and doesn’t splat. Alternatively, if they let their hand sink slowly into the slime it feels like a liquid, but if they pull it out quickly their hand is difficult to remove and feels like the liquid has set solid again.
* This substance behaves both like a liquid and like a solid. The movement helps to change the property of the material. Other ‘liquids’ with similar properties include toothpaste, non-drip paint and ketchup. Could they walk in a swimming pool filled with custard? (Watch the Braniac Science Abuse clip on YouTube ([here](https://www.youtube.com/watch?v=JkS1ymQ73oc)) to prove this).

**Observing properties of solids, liquids and gases****Sort / Group / Compare / Classify*** Is it a solid, a liquid or a gas? Use a variety of everyday items, for example from the bathroom the kitchen, and see if the children can sort them into solid, liquid, gas or a
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| **Science** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| combination of some or all. Include some items that require discussion, for example, cotton wool (solid but not hard plus it has gas/air within it); bath salts/cooking salt (solids which can pour); toothpaste (for KS2 it is acceptable to use the ‘every rule has its exceptions’ phrase for more complicated examples and toothpaste is made of solid material within a liquid and so has properties of both); liquids of different thickness/runniness/viscosity; foam (is it a gas or solid or liquid or a combination); bath fizzer (solid but produces a gas when put in water). Record verbal discussions whenever possible or take notes of children’s responses whilst facilitating the activities.* Once the children have sorted their items, ask children to write a definition of a solid, a gas and a liquid with words to describe each one. The aim is not to get a perfect definition at this stage but to explore the children’s own thoughts and the language they use as an **assessment** of their starting points.

**Explore / Observe / First-hand experience****Is it true or false (or are you not sure)?*** Provide children with a variety of statements and ask them to consider whether they are true or false. How would they find out or collect evidence to prove or disprove the statement? Example statements could include:
* All solids are hard *(false)*.
* All liquids can be squashed *(false).*
* All liquids can be changed into a solid in a household freezer *(false).*
* All liquids take the shape of the container they are in *(true).*
* Some liquids are sticky *(true).*
* Liquids and some solids can be poured *(true).*
* Let the children plan how they will find out and then allow them exploration time in another session. The liquids and solids statements ([here](https://www.sgsts.org.uk/SupportForVulnerablePupils/EMTAS/Shared%20Documents/Liquids%20and%20Solids%20Statements.pdf)) could be used for further statements.
* If the children require more practise with observing solids, liquids and gases, additional ideas can be found on the National Stem Centre website ([here](http://www.nationalstemcentre.org.uk/elibrary/resource/9316/solids-liquids-and-gases)). This booklet by the Society of Chemistry has some practical ideas for introducing solids, liquids and gases and their properties to accompany the true/false activity above.

**Describing a solid, a liquid and a gas****Sort / Group / Compare / Classify: How can you describe a solid, a liquid and a gas?*** The states of matter game ([here](http://www.collaborativelearning.org/statesofmatter.pdf)) is an excellent resource where children have to sort a variety of statements into those which describe a solid; those which describe a liquid or those which describe a gas.
* The game can be played on two levels; one which uses observable features only (which links to the statutory requirements in NC2014) and one that can be used as an extension activity which uses observable features and statements linked to the behaviour of particles in each state (the latter is not statutory at lower KS2 in NC2014 but can be a useful way to explain why solids, liquids and gases behave in different ways).
* Individually, can children refine their definitions of a solid, liquid and a gas (assessment)? They can then pool their ideas and make a group definition which could be displayed in the classroom, with each group providing a slightly different definition. Have a class vote on which is the best group definition of each word and discuss why.
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| **Science** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| * To explore gases and liquids further, select one from the following ideas:
* **Practical investigation: Do all liquids have the same runniness?** This statement provides a good starting point for a class investigation, each group deciding how they are going to carry out a test, how they would keep it fair, which liquids they would test and how many in order to get a good selection of evidence. Put different liquids on a ramp and test how quickly they move. As an extension children can consider whether changing the temperature of the liquid makes a difference. Compare liquid samples that have been in the fridge with samples at room temperature. Can they suggest why there is a difference?
* **Practical investigation: Do all liquids behave exactly the same?** The refreshment stand owner has asked the children for their help to research the best ketchup for his customers. There are several things he is looking for:

**-** The ketchup must not splat too much when the customers squirt it onto their hotdogs.**-** The ketchup must not be too runny to avoid it running off the end of the hotdog and onto the customers’ hands.**-** It must taste nice.Children must devise different tests to find the best ketchup (test three from a selection of six) and then present their findings to the refreshment stand owner suggesting which ketchup would be the best for his customers. Children could write a letter to the refreshment stand owner explaining what they have found out.* **Practical investigation: How much gas (air) is in a sponge?** Observe different sponges using senses, magnifiers and handheld microscopes to see the size and configuration of the holes. What is in the holes? Encourage children to think of air/gas rather than an initial thought of ‘nothing’. Using four different sponges (preferably a couple that are quite similar to encourage deeper thinking) can the children predict which has the most air in? How could they find out? Collate their ideas. They could then go on to test by putting sponges in water, lifting them up until the majority of water had drained out and then squeezing out whatever water was left ‘held inside’ to measure the volume of liquid. This would represent the volume of gas in the sponge.

**Research**: **Are all gases the same?*** With children working in groups of six, provide them with the following gas labels; oxygen, carbon dioxide, methane, helium, hydrogen, nitrogen. Each person must find someone from another group with the same gas label as them. From information provided (which can be differentiated) or from internet research, the children must work together to find out two pieces of information about their gas to take back to their home group. On return to the home groups, the children can produce a poster for display or a PowerPoint about different gases. Can they find a picture to best represent their particular gas in everyday life?

**Create / Invent / Design**: **Can you invent a ‘flinker’?*** Use a helium balloon and create a ‘flinker’. Explore adding different masses to a helium balloon so it doesn’t float to the ceiling or sink to the floor but ‘flinks’ in the middle.

**Introducing Temperature****Thinking Activity: What temperature is it?*** **How hot or cold is it? Can you guess the temperature?** Provide children with cards, including the following:

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| can of coke from fridge | warm hot chocolate drink | temperature of the room |
| your scrunched palm | boiling water | coldest day last year |

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| **Science** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
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| warmest day last year | centre of a bonfire | ice cream from the freezer |
| water from the cold and hot taps | water from a puddle outside | temperature at different places around the school both inside and out |
| inside a jacket potato from the oven | inside your body | a hot bath (that you can get into |

* Can the children guess how many degrees Celsius each of the items would be? How accurate were they? Allow the children to explore using a thermometer and develop their skill of reading its scale (some of these can be tested and some will need to be researched).
* Can the children predict the temperatures first from what they know the temperature of the classroom is? (Consider **Health and Safety** regarding carrying glass thermometers around. Data loggers are a more convenient way of collecting data in the field although children still need to practise reading a scale on a thermometer).
* **Equipment and measures** - practise using a thermometer to test different temperatures (data loggers give a numerical value so can be used to support children who are struggling with the scales on a glass thermometer). Children experiment holding a thermometer by the bulb end and then the other end and observe it in a warm liquid and then in the room air. The key idea is that they need to be aware the thermometer does not return to zero each time but measures the surroundings it is currently in. This is a basic introduction to the use of a thermometer which will be revisited in Year Five.
* **How quickly will it warm up?** Use data logging opportunities to observe ice from the freezer and record its temperature change as it melts. *(Ice straight from the freezer will have a temperature of -18°C. It is only O°C at its melting point)*. Can the children predict how long it will take for the temperature to reach zero degrees Celsius? Can the children suggest the pros and cons of a data logger over a glass thermometer?
* If children need further practise in using a thermometer then the following activity can be used using colour changing thermal indicators. Many gift websites stock mugs, t-shirts, etc. that are covered in a thermochromic material which changes colour as it gets warmer. Explore this technology with the children and challenge them to find out the minimum temperature required for a colour change to happen. This is a useful activity to practise and develop the skill of using a thermometer, ‘trial and error’ testing and collaborative working. Thermochromic Smart Cord is available from the Mindsets website ([here](http://www.mindsetsonline.co.uk/Catalogue/ProductDetail/thermochromic-smart-cord?productID=9c9bb47d-dd37-4644-99f1-a5a64782c490&catalogueLevelItemID=00000000-0000-0000-0000-000000000000)) and is a cheaper alternative to colour changing mugs. Below 27°C the cord is pink but above this temperature the colour disappears. The pink then reappears when the temperature drops below 27°C.

**Introducing Freezing and Melting (Observing the effect of changing the temperature)****How does a solid (ice) change to a liquid (water)?*** Choose ***one*** activity from those listed below unless the children need further consolidation:
* **Observe over time: What happens to the ice after a while?** What happens if food colouring is added to ice using a pipette? What happens if salt is sprinkled on ice before adding the food colouring? How can an ice cube be made to melt quickly? Take pictures of an ice cube melting every minute. Print them out and sequence them, annotating the pictures. Compare ice with ‘Insta Snow’ available from the TTS website ([here](http://www.tts-group.co.uk/shops/tts/Products/PD1726800/Instant-Snow-Powder/)). What are the similarities and differences? What do they each feel like?
* **Observe over time / Looking for a pattern:** **Water / Ice / Snow:** Explain that the children have been asked to make an ice sculpture for a party but they need to know how long the ice sculpture will last for once it is placed on the tables at the party venue. Have a trial run before the party to find out how long will they last. Observe and measure changes over time by using paper strips to measure the size/circumference of a large block of ice every half an hour. The strips can be used to make a graph of each of the measurements. Alternatively, children could collect the melted water and measure the volume – then make a graph of how the melted water increases over time. Children can test two blocks of ice of the same size; one placed indoors and one outdoors, comparing the graphs produced from each. What do they notice? Ice
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| **Science** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| sculptures can be made for an actual party. What shape container will they use? What will they put inside their ice (plastic objects, natural materials?) Will they add any colour?* **Observe over time / Looking for a pattern: Water / Ice / Snow**: Does putting a coat on a snowman make it last longer or melt quicker? The National Stem Centre website ([here](http://www.nationalstemcentre.org.uk/dl/138b88532cf69f2ebc30df1f945b34f6dcb822ca/3863-snowman-final-01-partII.swf)) has a concept cartoon to introduce this activity as a thinking task. Often children are told to put a coat on to keep warm. Will this keep the snowman warm or cause him to melt? In fact, the coat/material acts as an insulator and so actually makes the snowman last longer. Children could test this by freezing small cups of water to represent snowmen of the same size and then adding different material over each small ice block (held in place with an elastic band) to represent the coat. Can they spot a pattern after observing over a period of time?

**Introducing evaporation and condensation (observing the effect of changing the temperature)****Explore / Observe / First-hand experience*** How does a liquid (water) change to a gas (water vapour)? How does a gas (water vapour) change back to a liquid (water)? The following activities can be used to show what happens to water as it is heated. Two activities should be adequate unless the children need further consolidation. Alternatively set several activities up over an afternoon and get different groups to try different experiments and then report back to one another about their findings.
* **What happens when we heat water?** Set up a data-logger demonstration with water being heated in a pan (or kettle). A risk assessment for handling of hot water **must** be carried out. Show the children the graph of a continuous log of the temperature of water as it is heated. This could be a modelled activity on the whiteboard. Will it keep getting hotter and hotter forever or will something else happen?

Can children predict what the graph will look like after a period of time? Provide them with a graph showing two axes, the horizontal labelled ‘time’ and the vertical labelled ‘temperature’ and ask them to sketch how the graph will continue. Most children will predict that the temperature will continue to get higher and higher, in fact, it will rise until 100 degrees Celsius and then the water begins to evaporate and change into a gas rather than just getting hotter and hotter. Children could view the ‘Freezing and Boiling Points’ clip from the BBC Bitesize website ([here](http://www.bbc.co.uk/education/clips/zrmqxnb)) and discuss.* **What happens to a puddle over a period of time?** Observe a puddle over the course of the day, recording how it changes in size. Measure the temperature of the liquid at different intervals during the experiment.
* **Where has the liquid come from?** Half fill a painting water pot with warm water and put a Petri or transparent plastic plate dish over the top – pointing out to the children that the petri dish is dry when it is placed on the pot. After a couple of minutes observe the condensation on the underside of the Petri dish. Where has the water come from? Let the children write down their own ideas first (this can be used as a mini assessment task) and then get them to share their ideas to compile a group response. The use of the modelling activity below may aid children’s understanding of what is actually happening beyond just observing the process). Challenge the children to think what colour the condensation would be if ink or food colouring was added to the water or if the liquid was hot chocolate. It is the water that evaporates and then condenses each time so it will always be clear.
* **Why won’t my water boil?** This could be a problem sent by a camper or shipwrecked survivor: “I have left the clean drinking water in the sun all day. You’d think it would get enough heat by now. But the water still isn’t boiling for my cup of tea. Can you help?” What is the hottest we can get water if left in bright sunshine? How can we get water to boil? How hot does it have to be to boil?
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| **Science** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| **Planning an investigation**: **Can you design an experiment to investigate evaporation further?*** This activity will allow the children to apply their learning of evaporation and allow for further discussion of this abstract concept.
* Ask children to wet one of their hands in a bowl of water, remove and then gently shake. They should then place their wet hand on a paper towel, drawing around the handprint every minute. Ask them to watch what happens and discuss where all the water has gone. To add to the challenge, half of the class could use warm water and half could use cold water. What differences do they notice about how quickly the water ‘evaporates’?
* Provide each small group of three to four pupils with 20ml of water. Challenge them to design a way to make the water evaporate quickly. Who can make their water evaporate the quickest? What do they think will make it evaporate quicker? Questions can be used to get the children thinking e.g. what would be the best container to put the water in? What would be the best place to put the water? What else might help? Have some suggestions ready on a card, to support children who are struggling to come up with their own ideas, for example:
* Would the better container be a small container or a large, shallow container?
* Would it be better to put it inside or outside?
* Would it better to be in a cooler or a warmer place?
* Think about washing drying on a line – what makes a good drying day? How can you create your own wind? Where would washing dry the quickest in the school/school grounds? Children could go on to test small pieces of material hung on a makeshift washing line – how long do they take to dry?

**Practical investigation (fair test): Do all liquids evaporate?*** Possible liquids to try include: cordial, food colouring, vegetable oil, nail varnish remover, washing up liquid, shampoo, hot chocolate, milk, syrup, vinegar, etc.
* Encourage the children to decide how much of each liquid they will test. Small amounts placed in shallow containers will provide results more quickly. Do all liquids evaporate at the same rate? Can the children provide a conclusion linked to this question using evidence from their experiment?
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| **Science** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| **Modelling changing state: What is it like in a solid, liquid or gas?*** After observing changes of state in a variety of ways and describing how changing the temperature effects ice, water and water vapour the following modelling activities help to explain why these changes occur. ‘Particles’ are not statutory in the NC2014 but can aid children’s understanding of what is happening.
* What is it like in a solid, liquid or gas? Why do they behave that way? Model the movement of particles in a solid, liquid and gas through drama with children working in groups of about six.
* In a solid, the particles are very tightly packed and only move a tiny bit as small vibrations. Children can link arms and pack tightly together, vibrating up and down a little.
* In a liquid, the particles are still linked (children holding hands) but they have a little more energy so they can move around a little more. Children can be holding hands and can spread out and move a little more freely, flowing as if creating a puddle/pool.
* In a gas the particles have a lot more energy and can spread out to fill the space they are in. Children can start back to back and then walk in a straight line away from one another. If they touch an object they change direction but continue to move in a straight line. How quickly does it take for the gas, such as the smell from an air freshener to fill the entire room?
* For an additional modelling activity, use a large sheet and approximately twenty table tennis balls or polystyrene craft balls. Give half the children a blue sticker, they will be the condensers. Let all of the children hold on to the edges of the sheet like they would with a parachute for parachute games. With the balls in a bucket ‘pour’ them onto the sheet and ask the children to create a ‘puddle’ in the middle of the sheet. What are the balls/particles like? They are close to each other but can move. Ask them to try to move the ‘puddle’ around the sheet without ‘spilling’ any. Warm up the ‘water’ slowly (gently lift the sheet up and down a little) which gives the balls/particles some more energy, just enough to make the ‘particles’ move apart slightly and lift slightly above the surface. This is a bit like evaporation where water changes to a gas at the surface and can occur at any temperature. Now add more heat (more energy, more vibrant shaking of the sheet). The ‘particles’ have more energy, move more and are lifted to move in the entire room (watch your heads for water vapour particles). The condensers (children with a blue sticker) can collect the water particles which have cooled down and have turned back to a liquid (i.e. they collect the balls from the floor and add them back to the sheet). On a signal these can be heated again and changed to a gas and so the process/cycle continues.
* Take photographs of either of the modelling activities and ask children to describe them using the vocabulary solid, liquid, gas, change, temperature, energy, condense.
* For further consolidation of the behaviour of solids, liquids and gases:
* The video ‘The behaviour of particles in solids, liquids and gases’ from the BBC Bitesize website ([here](http://www.bbc.co.uk/education/clips/zpbvr82)) can accompany the modelling activity and consolidate the learning.
* The APBI website ([here](http://www.abpischools.org.uk/page/modules/solids-liquids-gases/slg2.cfm)) provides some animated clips of the behaviours of solids, liquids and gases to support states of matter and change associated with temperature.

**Questioning / Assessment*** Children’s answers for the following, in their own words, can be used as an assessment of their learning:
* What if all the water in the world was always ice?
* PMI (plus, minus, interesting) - Encourage the children to think of something good (plus), something not so good (minus) and something interesting for ‘A house made of ice’.
* PMI (plus, minus, interesting) - Encourage the children to think of something good (plus), something not so good (minus) and something interesting for ‘The freezing point of water becomes 100 °C’.
* What If all liquids became solids at room temperature.
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| **Science** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| Children can discus one or more of the above and jot down their thoughts in their own words. They could then pool all their ideas together for their table or group and design a ‘what if…?’ poster for display. Can they add a humorous element too?**The effect of temperature on other materials*** Choose from the examples below to investigate the effect of changing the temperature:
* **Explore / Observe / First-hand experience:** Can children respond with true or false, or yes, no, maybe to the statement ‘all liquids go solid if left in a freezer overnight’. Explore then observe what happens. The temperature of a household freezer is usually around -18 degrees Celsius. Is this cold enough to freeze or solidify all liquids? This could be used as a homework activity.
* **Explore / Observe / First-hand experience: Melting Chocolate** Melt chocolate in different ways from the list below:

**-** In a ziplock bag massaged in hand to melt.**-** In a ziplock bag held in warm water.**-** In a microwave.**-** In a bowl over a bowl of warm water.**-** In a Petri dish/plastic plate over a cup of warm water.* Describe how each feels after one minute. Time how long it takes to melt a ‘chunk’ of chocolate. Write a report called ‘The best way to melt chocolate’. This could be linked with the poem ‘Chocolate’ by Michael Rosen from the book ‘Centrally Heated Knickers’ which can also be found on Google Books ([here](https://books.google.co.uk/books?id=pqIV-ffjGL0C&pg=RA1-PA27&lpg=RA1-PA27&dq=look+at+me+i%27ve+got+chocolate&source=bl&ots=eXBJfU7lxw&sig=L2HzESrL9LIIJTpmqhfcdVXjL8o&hl=en&sa=X&ei=vWf7VJfPMISu7gaApoDYBA&ved=0CDEQ6AEwAw#v=onepage&q&f=false)).
* **Explore / Observe / First-hand experience: Making Ice Cream** (to observe the effect of cooling down cream). Instructions for how to make ice cream can be found in the ‘Fun Science’ book available from the Lancashire website ([here](http://www3.lancashire.gov.uk/lpds/publications.asp)), on the Planet Science website ([here](http://www.planet-science.com/categories/over-11s/chemistry-chaos/2011/07/make-your-own-ice-cream.aspx)), or with pictures on the Snapguide website ([here](https://snapguide.com/guides/make-easy-ice-cream-1/)). Once the ice cream has been made, challenge the children to come up with an alternative approach… What if we…? for example, tried yoghurt instead of cream, tried soya milk instead of cream, etc.
* **Research:** Find out what temperature vegetable oil boils at. Research boiling temperatures of other materials such as iron, steel, etc. Investigate questions such as: What happens if we heat oil too much? Does oil freeze in a household freezer?
* **Looking for evidence:** Can the children find examples of water vapour, water and ice in everyday situations in the home or outside and make a list. Can they find an image to represent water in different states? This could be suitable as a homework activity.

**Real outcome: Introducing the water cycle****Research*** In groups, can the children produce four verses of a song/poem to describe the stages of the water cycle? They have to create a verse for each of the following:
* evaporation (from rivers and streams).
* condensation - forming clouds.
* precipitation – falling as rain.
* rain falls into streams and rivers and these flow downhill towards the sea.
* back to stage one again.
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| **Science** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| The children can attempt to sing it to the tune of Frere Jacque / Pitter Patter Raindrops. It encourages them to use their everyday language and scientific vocabulary to explain their understanding of the process. * Alternatively, explain to the children that they are going to find out about the water cycle and create a presentation to explain the cycle to others. They can choose from a song, a piece of drama or movement or a poster. Their presentation must:
* Be interesting, clear and simple enough for others to understand.
* Use the scientific vocabulary: precipitation, evaporation and condensation.
* Explain each of the words in terms of the science going on.
* Show the correct order of the cycle.
* Take a maximum of three minutes to perform / explain.

**Modelling*** After researching the water cycle, children could be challenged to make their own water cycle as a mini ‘model’ of the process. There are some suggestions on the Science Net Links website ([here](http://sciencenetlinks.com/esheets/models-water-cycle/)) or the Science Sparks website ([here](http://www.science-sparks.com/2012/07/30/make-a-mini-water-cycle/)). Children can consider the following:
* How can they heat the water in their ‘environment’?
* How can they change the water vapour back into a liquid and collect it, allowing it to drip back to the ‘earth’ again as ‘rain’? (Tip: plastic bags and mirrors made cold with ice work well to represent the colder air above the Earth’s surface).
* Can they explain their model using evaporation and condensation and a reversible change?

**Weather, water cycle and global warming*** This learning can enhance the work on the water cycle at the end of the unit and provide a link to real news stories.
* **Research**: **What do we know about global warming?** The WWF website ([here](http://posters.panda.org/gallery/climate-posters)) has a selection of posters that show artists’ impressions of climate change. Print a selection of these images along with other images of things which contribute to climate change. Allow the children to explore the pictures and talk about the common theme. What questions do they raise from their discussions?
* **Research: The effects of global warming on the water cycle** For schools that subscribe to the Primary upd8 website, the ‘Levels Rising’ resource ([here](http://www.primaryupd8.org.uk/activity.php?actid=79)) considers melting of glaciers. Alternative sources are the short clip ‘Arctic Meltdown: Rising Seas’ from the First Science TV YouTube channel ([here](https://www.youtube.com/watch?v=mtMkSg-x1vg)); the BBC News website ([here](http://news.bbc.co.uk/1/hi/sci/tech/7261171.stm)); National Geographic website ([here](http://environment.nationalgeographic.com/environment/global-warming/gw-overview.html)); Global Warming Art ([here](http://www.globalwarmingart.com/wiki/File%3AMcCarty_Glacier_jpg)); A Student’s Guide to Global Warming from the EPA website ([here](http://www.epa.gov/climatechange/kids/)). These resources encourage children to discuss and think about the effects of global warming caused by carbon emissions. It could lead into an activity based on the following questions: How much energy do we use? How much energy do we waste? How we can reduce our energy consumption?
* **Research:** Play ‘Beat the Heat’ from the Northern Ireland curriculum website ([here](http://www.nicurriculum.org.uk/key_stages_1_and_2/areas_of_learning/the_world_around_us/activities/main.swf)). The interactive game allows the player to examine the long term effects of carbon dioxide emissions on our planet. It encourages persuasive argument and debating skills.
* **Explore / Observe and Practical Investigation:** See ‘Icebergs Ahead’ from the Northern Ireland curriculum website ([here](http://www.nicurriculum.org.uk/key_stages_1_and_2/areas_of_learning/the_world_around_us/activities/task5.asp)). This resource includes an experiment to investigate the factors affecting icebergs melting. Children have to use scientific vocabulary from their work on the water cycle to explain the processes involved, thus assessing their understanding.
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| **Science** |
| **Creative Learning Opportunities and Outcomes** |
| **Key questions*** Is it solid, liquid or gas?
* How do we know?
* What features do they each have?
* What would it be like if you could shrink and go inside a solid, liquid or gas?
* Are all solids the same?
* Are all liquids the same?
* Are all liquids colourless?
* What happens if a liquid is placed into a different container?
* What happens if you tilt a container that a liquid is in?
* Can you spill a solid?
* Are all gases the same?
* How do we smell things?
* How can we change water into a solid, liquid and a gas? Can you change it back again?
* How hot or cold is it? How do you know? How can you measure it?
* What happens if you change the temperature?
* Where does all the rain come from? Where does all the rain go?
* What happens when you heat water?
* How are clouds formed?
* How do humans affect the water cycle?
* What is global warming and how is it affecting water around the world?
* How can we reduce our carbon footprint? / How can we save energy**?**

**Key vocabulary*** Solid, liquid, gas, property, change, temperature, change state, heated, cooled, temperature, degrees Celsius, water cycle.
* Condensation/condense, evaporation/evaporate, melting/melt, freezing/freeze, solidification/solidity, boiling temperature.
* Particle, air, carbon dioxide, oxygen, helium, natural gas, viscosity.
* States of matter.
* Measure, compare, group, research, observe.
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| **Science** |
| **Key Learning** |
| **Material Properties - Rocks*** Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
* Describe in simple terms how fossils are formed when things that have lived are trapped within rock.
* Recognise that soils are made from rocks and organic matter.
* Rocks and soils can feel and look different.
* Rocks and soils can be different in different places/environments.

***Notes and Guidance (Non-Statutory)*** *Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.* **Pupils Might Work Scientifically*** By observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time.
* By using a hand lens or microscope to help them identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them.
* By researching and discussing the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed.
* By exploring different soils and identifying similarities and differences between them and investigating what happens when rocks are rubbed together [hardness test] or what changes occur when they are in water [permeability test].
* By raising and answering questions about the way soils are formed.
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| **Science** |
| **Creative Learning Opportunities and Outcomes** |
| **Wow launch*** Share with the children the discovery of Craggy Cliff which can be accessed via The Telegraph website ([here](http://www.telegraph.co.uk/news/newstopics/howaboutthat/11157434/Craggy-face-of-Cliff-appears-in-rocks-on-Devon-coast.html)). The features of a man, resembling a character from Lord of the Rings appeared near Hope Cove in Devon in October 2014. Tell the children this cliff face wasn’t made by man. Can they think of how it may have formed?
* Teachers may also wish to share information about other famous stones such as Stonehenge or Uluru (Ayers Rock) to further capture the children’s interests.
* Ask the children to work in groups to find two types of famous rocks and research where they are in the world and what makes them famous. What type of rock is it carved/made from? Teachers may wish to recommend suitable websites for children to use for their research, such as Livescience ([here](http://www.livescience.com/29844-worlds-most-famous-rocks.html.)).
* The book, ‘Everybody Needs a Rock' by Byrd Baylor could be used to set a context about making a rock collection. Children could bring rocks into school to contribute to a class rock collection or to enter into a rock competition. How many different categories could you have for prize winning rocks? Who can find the ugliest rock; sparkliest rock; most interesting rock; smallest rock; rock containing fossils; most colourful rock; rock with the greatest variety of fragments in it; rock with the largest fragments in it; rock with the most stripes; rock with the most holes? Can the children sort their rocks and other rock samples by their own criteria?

**Explore / Observe / First hand experience*** Provide an Easiscope or a Talking Magnifier for children to closely examine the different rocks. Ask them to take a picture and annotate with their observations. They may wish to consider questions such as: What colour is your rock? Can you see grains or crystals in it? Is it powdery? Are there different layers, air pockets etc.

**Modelling*** What is under your feet? Ask children to describe what they think is under the grass (it would make sense for the children to be sitting on some grass at this point if appropriate).
* Describe the layers under the grass as:
* **Top soil**: rich in nutrients, containing rotting vegetation/leaf litter and live organisms.
* **Subsoil**: tightly packed soil, lighter in colour to the top soil as it contains fewer nutrients.
* **Rocky soil**: rocks breaking down in to soil.
* **Bedrock**: which is just rock.
* **Earth’s crust**: a thin layer of cold, hard rock about five to fifty miles thick.
* **Mantle**: hot, molten rock a bit like treacle.
* **Outer and inner core**: made of metal and much hotter than the mantle.
* To help children remember the layers, make a 'dirt pudding’. Ingredient suggestions are given below but these can be altered to fit the criteria. In a clear plastic drinking cup add the following ingredients, layering each on top of the other to represent the different layers:
* Under the earth's crust: A squirt of red ice cream sauce or golden syrup to represent the **mantle, inner and outer core**.
* The earth's crust: Add a biscuit on top (which fits the bottom of the cup) to represent the **earth’s crust**.
* Bedrock: Add some layers of wafer thin chocolates or slices of fruit such as apple to represent the **bedrock**.
* Subsoil: Add some instant chocolate dessert to represent the **subsoil** *(it is lighter in colour as it contains fewer nutrients than the top soil and is densely packed and clay like).*
* Topsoil: Crush some biscuits such as Oreos to make the nutrient rich **top soil**. This can be sprinkled on top.
* Organic Matter/Leaf Litter: Add some jelly worms to represent the organisms living in the decaying **organic matter/leaf litter**.
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| **Science** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| * Before eating the ‘dirt pudding’ the children can draw or photograph the layers and then annotate with their understanding of the layers. Ensure that children understand that the consistency and texture of the earth layers will NOT be the same as those made by the food types.

**Modelling: Edible rock*** What features does your rock have? How does this give clues about how it was formed?
* Use sweets and cakes to explain about the features of different types of rocks and how they are formed. The terms sedimentary, metamorphic and igneous are not statutory within the key learning for children in lower KS2, but this provides a fun way to embed the concept that rocks are produced in different ways and this is what gives them their different properties. For this theme, children can use the examples below for **features of** sedimentary and igneous rocks. *As the metamorphic process and features are not required for this age phase and can over complicate the concept of identifying rock features – they have been left in the table for teacher information only).*

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| **Features of sedimentary rocks** | **Features of igneous rocks** | ***Features of metamorphic rocks*** |
| * Grains pressed together.
* ‘Cement’ holding grains in place.
* Sometimes different layers are visible.
 | * Evidence of cooling from a liquid.
* Trapped gas bubbles.
* Crystals.
 | * *Evidence of being heated (cooked in cake analogy).*
* *Uneven squashing of layers over time.*
* *Evidence of flow (but not fully melting).*
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Sweet and cake examples to use as a model of the ‘real’ rocks.

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| **Sedimentary rocks** | **Igneous rocks** | ***Metamorphic rocks*** |
| * Cereal bar.
* Seed bar.
* Chocolate rice crispy cakes.
 | * Cinder toffee.
* Aero/Crunchie chocolate bars.
* Boiled sweets.
* Sugar crystals (not sugar cubes as these can be confused with sedimentary grains).
* Stick of rock.
 | * *Marble chocolate.*
* *Marble cake.*
* *Squashed Angel cake – layers can have slid across one another.*
* *Layers in a Mars bar.*
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* Children could go on to make cinder toffee observing how a gas produces the ‘holes’ in the finished sweet.

**Sort / Group / Compare / Classify*** This activity could lead the children to sorting real rock samples as igneous or sedimentary based on the features in the table above.

**Research: Rock solid*** The 'Rock Solid' unit on the Webquest website ([here](http://www.nhm.ac.uk/education/online-resources/webquests/launch.php?webquest_id=10&partner_id=hist)), which is part of the National Museums Online Learning Project, can be used to support research alongside other hands-on science enquiry. The quest sets children the challenge of preparing a display for school on different types of rocks and their uses. They are led through a series of tasks and are given the choice of one particular sample to research in more depth – clay, limestone, marble, sandstone or slate. They describe features of their rock and then consider how their chosen rock is used with real world examples and images.
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| **Science** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| **Sort / Group / Compare / Classify:** **Testing rocks***(These could be done as a carousel of activities over an afternoon).***How hard is your rock?** * Ask children to use the scratch test by scratching, for example, chalk, rock salt and quartz with a nail, paper clip, fingernail or toothpick (let children decide what the best ‘tool’ for the job is). Did their tool scratch the sample? Which is the hardest rock (hardest to scratch)? Encourage them to try with some other samples. Can they order them in their own ‘hardness scale’? Children could use the Kids Love Rocks website ([here](http://www.kidsloverocks.com/html/friedrich_mohs.html)) to find out more about how this is used by real scientists.

**Does it float?*** Many children, at first, believe most rocks will sink when put in water. Put various rock samples in water. Do they float or sink? Why do some samples float and others sink? Link this to the rock containing air. Does this give you a clue to how the rock was formed (trapped gas)? Try putting a house brick and a breeze block in water. Do either of them float?

**Does it allow water in? Is it permeable?** * Provide opportunities for children to use a pipette to drop water onto the surface of a rock sample. Does the water soak off or run off the surface? Link permeability of rocks to the fact there are air gaps within the rock. Children could weigh some rock samples and then soak the samples overnight in water. The next day they could weigh the rocks again to see how much water they contain. Which rocks hold more water than others?

**What happens if you add an acid (e.g. vinegar) to your rock sample?*** Following on from the previous investigation, provide opportunities for children to use a pipette to drop vinegar onto the surface of a rock sample. Does it react (fizz)? Does this give them a clue as to what the rock is made of? Rocks that fizz when in contact with an acid (e.g. limestone) contain calcium carbonate. Link this to weathering and the effects of acid rain on limestone cliffs.

**Real outcome: I’m a rock expert****Big book / presentation *(using PowerPoint or Explain Everything app)**** Tell children that they have been assigned the job of ‘Rock Detectives’ and they have to find out everything they can about:
* Rocks: their properties, where they come from and how they are formed.
* Fossils: what they tell us about the past.
* Soil: what soil is made up of and how soils can be different.

They will be producing a book or a presentation all about rocks with the three chapters listed above, and an eye catching, professional looking front cover. Each section must include:* Key facts and information about the theme of the chapter/presentation.
* Either a ‘Try this’ section or a ‘Fabulous fact’ section on each page.
* Results or conclusions from some of the tests they have carried out.
* Images, either from their own photograph gallery or from another source.
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| **Science** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| Their work will be presented to Year Six and will be used as revision for their end of year tests so children need to ensure that their information is factually correct, interesting to read, and includes the key scientific vocabulary.* Teachers could use the ideas in the activities above and give children the opportunity in between the three sections (rocks, fossils and soil) to write their books/presentations.

**Key questions*** What is rock?
* How can rocks be different?
* What are rocks used for?
* How can we test rocks/compare rocks?
* How hard is your rock?
* Does it float?
* Does it allow water in? Is it permeable?
* What happens if you put an acid on your rock?
* What if all rocks were the same?
* How do rocks change over time?
* What are fossils?
* How are fossils formed?
* What can fossils tell us about the past?
* What is soil made up of?
* How is soil formed?

**Key vocabulary*** Words describing rocks e.g. rock, stone, pebble, slate, marble, chalk, granite, sand, sandstone, hard, texture, grains, crystals, contains fossils, bits pressed together, sedimentary.
* Words describing soils e.g. darker, lighter, organic matter, leaf litter, grains, clay, sandy, grains.
* Rub together, break apart/break up, permeable, non-permeable, acid rain, weathering, erosion.
* Comparison/compare, description/describe.
* Words which have different meanings in other contexts e.g. test, fair, conclude.
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| **Geography** |
| **Key Learning** |
| **Locational Knowledge** *(revise this in the context of world rivers)** Locate the world’s countries, using maps to focus on Europe (including the location of Russia) and North and South America.
* Name and locate counties and cities of the United Kingdom.
* Identify the position and significance of latitude, longitude, Equator, Northern Hemisphere, Southern Hemisphere, the Tropics of Cancer and Capricorn.

**Human and Physical Geography*** Describe and understand key aspects of:
* **physical** geography, including rivers and the water cycle.
* **human** geography, including: types of settlement and land use, economic activity including trade links, and the distribution of natural resources including energy, food, minerals and water *(focusing on those aspects relating to rivers).*

**Mapping*** Use a wider range of maps (including digital), atlases and globes to locate features studied.
* Use maps and diagrams from a range of publications e.g. holiday brochures, leaflets, town plans.
* Use maps at more than one scale.
* Recognise patterns on maps and begin to explain what they show.
* Use the index and contents page of atlases.
* Label maps with titles to show their purpose.
* Recognise that contours show height and slope.
* Use four figure coordinates to locate features on maps.
* Create maps of small areas with features in the correct place.
* Recognise some standard OS symbols.
* Link features on maps to photos and aerial views.
* Use a scale bar to calculate some distances.

**Fieldwork*** Use the eight points of a compass.
* Observe, measure and record the human and physical features in the local area using a range of methods including sketch maps, cameras and other digital devices.
* Make links between features observed in the environment to those on maps and aerial photos.

**Enquiry and Investigation*** Ask more searching questions including, ‘how?’ and, ‘why? as well as, ‘where?’ and ‘what?’ when investigating places and processes.
* Make comparisons with their own lives and their own situation.
* Show increasing empathy and describe similarities as well as differences.
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| **Geography** |
| **Key Learning (contd.)** |
| **Communication*** Identify and describe geographical features, processes (changes), and patterns.
* Use geographical language relating to the physical and human processes detailed in the PoS e.g. tributary and source when learning about rivers.
* Communicate geographical information through a range of methods including sketch maps, plans, graphs and presentations.
* Express opinions and personal views about what they like and don’t like about specific geographical features and situations.

**Use of ICT/ technology*** Use the zoom facility on digital maps to locate places at different scales.
* View a range of satellite images.
* Use presentation/multimedia software to record and explain geographical features and processes.
* Use spreadsheets, tables and charts to collect and display geographical data.
* Make use of geography in the news – online reports and websites.
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| **Geography** |
| **Creative Learning Opportunities and Outcomes** |
| **Purpose of the learning**In this theme, children will learn about rivers and the water cycle. This might be in the context of a local river study (fieldwork) and/or key aspects of the main rivers in the UK and in the wider world. Children will learn that rivers have sources, channels, tributaries and mouths, that they receive water from a wide area and that most flow eventually into a lake or the sea. They will learn that human activity affects and is influenced by rivers. They will link their learning about rivers to other bodies of water such as reservoirs, lakes, seas and oceans.**Key questions*** What is a river?
* How is a river different from other bodies of water? e.g. streams, canals, reservoirs, lakes etc.
* Where does the water come from? Where does it go? *(water cycle)*.
* Where are the key rivers in the world, in the UK, and locally?
* What are they like? How long? How wide? How much water?
* How did that river get like that? Why and how is it changing? Is the river still changing?
* How do rivers affect people’s lives and influence human activity?
* How do people affect rivers?

**Activities / Enquiry*** What do the children know already about water and rivers in particular? What would they like to know or find out about rivers? Add these questions to those above.
* Do the children know of any specific rivers?
* Find out if the children know where their nearest lake, river or other body of water, such as canal, reservoir, coast etc. is. Follow up by looking at local maps of the area.
* Develop Ordnance Survey map work skills by using OS maps of the local area and across the country such as those on the Digimap for Schools website ([here](http://digimapforschools.edina.ac.uk)) to identify water and river features. Use in conjunction with Google Maps or Bing Maps bird’s eye photos of the features ([here](http://www.bing.com/maps/)).
* Observe water in the school grounds on different days and in different seasons. Where does it collect and where does it go? Include gutters and drains. A key aspect for children to learn in this theme is that water flows naturally downwards, sometimes underground and eventually to the sea.
* Use a slightly sloping sand tray or slope with bare soil in the school ground to model the flow of a river from source to sea. A trickle of water will model features found in real rivers. It will erode the sand or soil to form a channel, bend and move sediment along. Use obstacles to create further channels or change the course of the ‘river’. Get children to carefully observe, describe and record what is going on.
* If possible visit a nearby river or stream. Choose one where it is easy to walk alongside but ideally with a bend. Identify and describe different features, sketching and labelling them. Take photos, including close-ups, of significant features to use later in the classroom alongside maps and aerial photos. Take large scale laminated maps and locate the river and associated features.

**Note: Always visit the river or other fieldwork site beforehand to carry out a risk assessment and follow your school’s guidelines for out-of-school visits.** |

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| **Geography** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| * Encourage children to ask questions or suggest investigations relevant to this particular river or stream giving them a sense of ownership. Provide prompts if necessary, such as:
* How fast is it flowing?
* Why is one side steeper?
* How deep is it?
* Why is it dirty?
* What lives in it?
* Where does the water come from?
* Why is it flowing in that direction?
* Use measuring tapes and sticks as well as data-logging equipment. Use floating objects and stop watches to measure the rate of flow of the water. Back in the classroom input the collected data into a database or spreadsheet. Use charts and graphs to look for patterns and present information.
* Use the river study as an inspiration for writing. Ask the children to close their eyes and listen carefully. They could collect words to help describe what they can hear and see.
* There are many new words associated with rivers and water so, throughout this theme, collect the technical vocabulary and create a glossary. Include geographical vocabulary that is colloquial or local.
* Investigate poems related to water and rivers, such as those in ‘Poems for the Geography Classroom’ by Mark Cowan. Use them as starters or to stimulate ideas and discussion. Many of the ideas at the beginning of the book could be used in any geography theme or across the curriculum. Investigate rivers in art and in stories.
* Consider the influence of rivers on human activity and decisions e.g. land use, location of settlements, industry, mills, as well as sports and leisure activities etc. Investigate the difference between rivers and canals especially if there is a nearby canal to visit.
* Developing children’s understanding of the natural environment and physical landscape should encourage their desire to protect and conserve it. The Canal and River Trust (formerly British Waterways) has many ideas and resources on their website ([here](https://canalrivertrust.org.uk/)) particularly the teachers’ resources section ([here](https://canalrivertrust.org.uk/explorers/teachers)) and the children’s area of the site ([here](https://canalrivertrust.org.uk/explorers)).
* Follow up water and river stories in the news both in the UK and worldwide. Investigate what happens when a river floods and why a river floods. What effect does this have on people? Which parts of the UK have suffered from flooding recently? The Geographical Association website has a useful set of resources on their website ([here](http://www.geography.org.uk/resources/floodinginsomerset/#16410)) focusing on the recent flooding in Somerset, in addition to a general unit on investigating rivers.
* Investigate underground water and rivers. Where are they and why are they underground?
* Research the major rivers of the world. Which is the main river in each continent? Which is the longest etc? Use satellite images of the river’s course, estuary, delta etc., such as those from Google Earth ([here](http://www.google.co.uk/intl/en_uk/earth/)).
* Play the Rivers game on the World Geography Games website ([here](http://www.world-geography-games.com/rivers.html)) for world rivers, or the Toporopa website ([here](http://www.toporopa.eu/en/rivers_of_europe.html)) for rivers of Europe. These games can be played online, but the Puffin web browser (more information ([here](https://itunes.apple.com/gb/app/puffin-web-browser/id406239138))) can be downloaded and used to enable Flash games to be played on an iPad (please note: this app is not free).
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| **Geography** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| * Choose a specific river to investigate further. This could be in the context of a region study e.g. the River Amazon when studying the Amazon Basin in Year Five. Or research the River Nile and the settlements and landforms along its course from source to sea, making links with learning opportunities in history. The Nile is the longest river in the world at nearly 7000 kilometres in length.
* The BBC Bitesize website ([here](http://www.bbc.co.uk/education/topics/zqdwxnb)) for various short clips based around rivers, including several on the journey of the River Nile.
* More river facts, including how rivers shape the land, can be found on the 3D Geography website ([here](http://www.3dgeography.co.uk/#!river-facts/cfvg)).
* This theme could be extended to include further aspects of water in the world e.g. the importance of water conservation, places in the world where there is not enough clean drinking water, consequences of drought etc.
* The charity Wateraid has a number of resources for schools focusing on global water issues on their website ([here](http://www.wateraid.org/uk/audience/schools)).
* Learn about your region’s water management systems, for example on the United Utilities website ([here](http://www.unitedutilities.com/Lancashire.aspx)) which details where investments are being made. United Utilities also have a section on their website with water resources for children ([here](http://www.unitedutilities.com/all-about-water.aspx)).
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| **History** |
| **Key Learning** |
| **Chronology**Show their increasing knowledge and understanding of the past by:* Using specialist dates and terms, and by placing topics studied into different periods (century, decade, Roman, Egyptian, BC, AD…).
* Making *some* links between and across periods, such as the differences between clothes, food, buildings or medicine.
* Identifying where some periods studied fit into a chronological framework by noting connections, trends and contrasts over time.

**Events, People and Changes**Be able to describe some of the main events, people and periods they have studied by:* Understanding some significant aspects of history including the nature civilisations *(e.g. how and why the River Nile was important to the Ancient Egyptians).*

**Communication*** Construct informed responses that involve thoughtful selection and organisation of relevant historical information.
* When doing this they should use specialist terms (e.g. ancient, pyramid and pharaoh) and vocabulary linked to chronology.
* Produce structured work that makes some connections; draws some contrasts; frames historically-valid questions involving thoughtful selection and organisation of relevant historical information using appropriate dates and terms.

**Enquiry, Interpretation and Using Sources*** Understand some of the methods of historical enquiry, and how evidence is used to make detailed observations, finding answers to questions about the past.
* Use some sources to start devising historically valid questions about change, cause, similarity and difference, and significance *(e.g. the lifestyles and beliefs of the Ancient Egyptians).*
* Understand some of the methods of historical enquiry, how evidence is used to make historical claims.
* Use sources as a basis for research from which they will begin to use information as evidence to test hypotheses *(e.g. about the lives of the Ancient Egyptians).*
* Identify some of the different ways in which the past can be represented, and that different versions of the past such as an event may exist *(artist’s pictures, tomb paintings, written sources)*.
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| **History** |
| **Creative Learning Opportunities and Outcomes** |
| In this theme, children will learn about the achievements of the earliest civilisations including those of the Ancient Sumer, the Indus Valley, The Shang Dynasty and Ancient Egypt, going on to study the latter in more depth. Children will compare and contrast these periods, identifying the particular strengths of each one and drawing parallels between them.**What is a civilisation?*** Explain to the children that this theme looks at early civilisations. Ask them to work in pairs or groups to discuss the word 'civilisation' and what they think it might mean. Explore children's ideas and agree a definition for the term. Encyclopaedia Britannica Kids ([here](http://kids.britannica.com/comptons/article-9272856/ancient-civilization)) defines it as *'the level of development at which people live together peacefully in communities. Ancient civilisation refers specifically to the first settled and stable communities that became the basis for later states, nations and empires.'*
* Show children the following terms and ask them to discuss which of these they think would have been found in an ancient civilisation and which would not.
* Hospital
* Houses
* Roads
* Cinemas
* Cars
* Farms
* Toilets
* Discuss reasons for choices and ask groups to consider any additional items which may have been found there.

**Ancient civilisations and their way of life*** Explain to the children that they are going to carry out research into four ancient civilisations – Indus Valley, The Shang Dynasty, Ancient Sumer and Ancient Egyptians. More information on each of these can be found on the Primary Curriculum website ([here](http://www.primarycurriculum.me.uk/support/history)).
* Display the table on the next page on the board and explain that their research is going to focus on those areas.
* Show the Professor Indus Game on the BBC Primary History website ([here](http://www.bbc.co.uk/schools/primaryhistory/indus_valley/art_and_writing/teachers_resources.shtml)) which is a click through game that can be led by the teacher. Ask the children to make notes of key elements on sticky notes throughout the activity. Alternatively, allocate research questions to individual children and explain that they should listen out for answers to those for discussion when the game has completed.
* Taking each section in turn, review the information on the sticky notes and agree what information will be written on the grid.
* On completion of the Indus Valley section, organise the children into three groups and allocate one of the remaining civilisations to each. Provide each group with the relevant column of the grid and sticky notes as in the previous activity. Children carry out research using a variety of appropriate sources which may include library loans, museum loans or websites such as:
* Mr Donn's Site for Kids and Teachers ([here](http://ancienthistory.mrdonn.org/index.html)).
* Kids Past website ([here](http://www.kidspast.com/world-history/0025-rise-of-civilizations.php)).
* Mrs Mitchell's Virtual School ([here](http://www.kathimitchell.com/ancivil.html)).
* On completion of their research, children should review their sticky notes and transfer the appropriate information to their column of the grid.
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| **History** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| * Reassemble the grid on the board by putting together the completed columns. Identify the similarities and differences between the four civilisations, focusing specifically on the significance of water to each, particularly for irrigating crops and for supporting trade links through travel.

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|  | **Indus Valley** | **The Shang Dynasty** | **Ancient Sumer** | **Ancient Egyptians** |
| Where does it fit on the timeline? |  |  |  |  |
| In what part of the world were they situated? |  |  |  |  |
| Were there any key cities? |  |  |  |  |
| Were they near to any water source? What was it? |  |  |  |  |
| Were they responsible for any inventions or discoveries? |  |  |  |  |
| Were there any key people or leaders? |  |  |  |  |
| What did they trade and who did they trade with? |  |  |  |  |
| What did they eat and how did they get it? |  |  |  |  |

**Focusing on Ancient Egypt*** Create a KWL grid with the class about Ancient Egypt. What they know (**K**), what they want to know (**W**) and what have they learned (**L**). Ask children to work in pairs or groups to discuss the K and the W, making notes as they go. Collect group responses and identify whether any of the 'want to know' statements can be answered from the information taken.

**Where are Egypt and the River Nile?** * Locate Egypt on a world map. Discuss the nearby seas and countries. Watch 'Egypt: The Nile: Then and Now' (no sound required) on the Discovery website ([here](http://www.discovery.com/tv-shows/other-shows/videos/discovery-atlas-egypt-the-nile-then-and-now/)) and identify clues about the terrain and climate, using words such as dry, hot, dusty, fertile. Note in particular the location of the greenery immediately next to the river. How might the terrain and climate affect the people, animals and plants that live there? How might it have affected them in the past? The clip 'How does the River Nile help people survive in Egypt' from the BBC Bitesize website ([here](http://www.bbc.co.uk/education/clips/z3rwmp3)) may be a useful addition.
* Returning to the map, or using a tool such as Google Earth ([here](http://www.google.co.uk/intl/en_uk/earth/)), examine the river, identifying the source, delta, and the names of large settlements in Egypt. Identify the position of Egypt relative to other countries with which they are familiar, such as the British Isles.
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| **History** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| **How did the Ancient Egyptians use the River Nile?*** The Ancient Egyptians farmed along the banks of the Nile because it was useful for transportation, the soil was good for growing crops and they had ready access to water from the river. During this time they invented the shaduf and the nilometer. Show children pictures of a nilometer on the Bible Places website ([here](http://www.bibleplaces.com/images12/Elephantine-Island-Roman-and-Arabic-Nilometers%2C-tb110700280-bibleplaces.jpg)), and a shaduf on Mr Zimmerman's website ([here](http://mrzimmerman.org/New%20Folder/images/37a4f900.jpg)). What do they think each invention might have been for? Collate responses and discuss, giving reasons for their thoughts. If there are differences in opinion, can they convince each other as to why they are correct? A clip about how the nilometer works can be found on the How Stuff Works website ([here](http://history.howstuffworks.com/30376-what-the-ancients-knew-nilometer-video.htm)) and information on the shaduf can be found on the Primary Homework website ([here](http://primaryhomeworkhelp.co.uk/egypt/farming.htm)).

**How was ancient Egypt ruled and who were the pharaohs?*** The King or Queen of Ancient Egypt was known as a pharaoh. They were the head of government, the commander of the army and the high priest of every temple. The Egyptians believed that pharaohs were half man and half god.
* These people lived thousands of years ago? How do we know their names and information about their lives? Discuss in pairs or groups. Watch the set of clips 'How do we know the names of kings from Ancient Egypt?' from the BBC Bitesize website (part 1 ([here](http://www.bbc.co.uk/education/clips/zvy2fg8)); part 2 ([here](http://www.bbc.co.uk/education/clips/zcrhgk7)); part 3 ([here](http://www.bbc.co.uk/education/clips/zd8ykqt)); part 4 ([here](http://www.bbc.co.uk/education/clips/z27rq6f)); part 5 ([here](http://www.bbc.co.uk/education/clips/zht86sg))). After the viewing, compare the information with their original list.
* Create a list of pharaohs inviting suggestions from the children. You may wish to include Akhenaton, Hatshepsut, Tutankhamen, Cleopatra VII and Ramses II. Ask the children to create fact files detailing at least five significant facts about the pharaohs. The following websites may be useful:
* Kidsgen website ([here](http://www.kidsgen.com/ancient_egypt/famous_pharaohs.htm)).
* Ducksters website ([here](http://www.ducksters.com/history/ancient_egyptian_pharaohs.php)).
* Luton Learning website ([here](http://www.learning.luton.gov.uk/l2g/custom/resources_ftp/netmedia_std/ks2/history/egyptians/worksheets/egyptian_pharaohs.pdf)).
* Kidzworld website ([here](http://www.kidzworld.com/article/996-egypt-famous-pharaohs)).
* Compare the fact files to identify similarities and differences between the pharaohs and their reigns.
* Through the clips above and other research children may have encountered hieroglyphs. Discuss what they were used for and what they tell us. The University of Manchester website ([here](http://www.childrensuniversity.manchester.ac.uk/interactives/history/egypt/hieroglyphs/)) has an interactive activity based around hieroglyphs which provides more information and some interesting questions.
* Find out about the Rosetta stone and how this transformed what historians know about Ancient Egypt. The BBC Primary History website ([here](http://www.bbc.co.uk/schools/primaryhistory/worldhistory/rosetta_stone/)) has more information.

**What was life like for different people and groups of people?*** Through shared reading, explore 'A day in the life of a pharaoh' from the PBS website ([here](http://www.pbs.org/empires/egypt/special/lifeas/pharaoh.html)). Ensure children understand all of the elements of the text, including any more complex vocabulary. Create a series of freeze frames of his day. Using a magic microphone technique, interview the people in role asking questions such as 'Who are they?', 'What are they doing?' 'How do they feel about their job? etc. Children respond in role with, for example, ' I am a bodyguard and I look after the pharaoh to make sure nobody can hurt him because he is a very special person to us. I feel honoured to serve my king.'
* Provide children with printed texts of 'A day in the life of a nobleman's family' and 'A day in the life of a farmer's family' from the Ancient Egypt website ([here](http://www.ancientegypt.co.uk/life/story/main.html)). Ask children to read the texts and identify similarities and differences between the lives of each and then compare to what they know about the life of a pharaoh from the previous activity. Discuss as a group and identify reasons for the differences, e.g. social class, money and their job.
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| **History** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| **What happened to Egyptians after they died?*** It was important to their religious beliefs that when Egyptians died, their bodies were preserved. This process was called mummification and was available to anybody rich enough to afford it. The University of Chicago website ([here](http://oi-archive.uchicago.edu/OI/MUS/ED/mummy.html)) has an excellent animated activity which allows children to interact with the embalming and mummification process. This can be followed up with the text on the Salariya website ([here](http://www.salariya.com/web_books/mummy/index.html)) which explains some of the terms in more detail.
* Ask the children to create an instruction handbook for somebody about to start their new job of mummifying people.
* The Woodlands Junior School website ([here](http://primaryhomeworkhelp.co.uk/egypt/mummies.htm)) has a wealth of information about mummification and further links.

**What were the pyramids and how were they built?*** The Egyptians built pyramids as tombs for their pharaohs and their queens to protect their mummified bodies and belongings.
* The PBS website ([here](http://www.pbs.org/wgbh/nova/ancient/explore-ancient-egypt.html)) allows children to see the pyramids as they are now including cross sections, inside and views from the top.
* Watch the clips on the BBC Bitesize website clips about the construction of pyramids, including:
* Building the Pyramids Accurately series: 1/2 ([here](http://www.bbc.co.uk/education/clips/ztmxpv4)); 2/2 ([here](http://www.bbc.co.uk/education/clips/zp6tsbk)).
* Building the Pyramids series: 1/5 ([here](http://www.bbc.co.uk/education/clips/z849wmn)); 2/5 ([here](http://www.bbc.co.uk/education/clips/zwk8q6f)); 3/5 ([here](http://www.bbc.co.uk/education/clips/zqdw2hv)); 4/5 ([here](http://www.bbc.co.uk/education/clips/z2jqxnb)); 5/5 ([here](http://www.bbc.co.uk/education/clips/zx72tfr)).

It is useful to watch them consecutively as they are part of the same series.* Discuss the information in each clip. Was there any information they found surprising? Ask the children to write diary entries from the point of view of Nakht. This should focus on his thoughts and feelings at key points in the process (from selection through to building).
* The following websites have more information on pyramids:
* Ducksters website ([here](http://www.ducksters.com/history/ancient_egyptian_pyramids.php)).
* History for kids website ([here](http://www.historyforkids.org/learn/egypt/architecture/pyramids.htm#!)).
* Mr Donn's website ([here](http://egypt.mrdonn.org/pyramids.html)).
* Consider the different information from all of the sources, such as the conflicting theories about who actually built the pyramids: some say farmers, some say craftsmen others say slaves. Can we ever be sure what happened during this time as it was thousands of years ago? Ask children what they think and why.

**How do we know about ancient Egypt?** * Nebamun was an Egyptian ‘scribe and ‘grain counter’ in Egypt. He was buried in a tomb, not a pyramid. The tomb was carved into a rocky hillside on the west bank of the River Nile.
* Examine the tomb paintings from Nebamun’s tomb on the Ancient Egypt website ([here](http://www.ancientegypt.co.uk/life/explore/main.html)) which provides more information about the tomb paintings by clicking on them. The British Museum website ([here](http://www.britishmuseum.org/explore/galleries/ancient_egypt/room_61_tomb-chapel_nebamun/nebamun_animation.aspx)) also has an animation which allows viewers to explore the tomb virtually.
* Ask children to use the sources to consider the following:
* Who might this person have been?
* What job might he have done?
* What do we know about his family?
* What did he hope for in the afterlife?
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| **History** |
| **Creative Learning Opportunities and Outcomes (contd.)** |
| * One of the most famous tomb finds was that of Tutankhamun. This was famous because when it was discovered it was almost entirely intact, unlike so many others which had had belongings taken from them.
* Recreate the discovery of Tutankhamun’s tomb by Howard Carter using the activity on the Key Stage History website ([here](file:///C%3A%5CUsers%5CAdministrator%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CTemporary%20Internet%20Files%5CContent.Outlook%5CN2WFJ47E%5C-%09http%3A%5Cwww.keystagehistory.co.uk%5Cfree-samples%5CKS2-history-Ancient-Egypt-history-lesson.html)).
* Children to work in groups to research Tutankhamun to further investigate what was found in his tomb and what it tells us about his life. Useful websites for this include:
* Woodlands Junior School website ([here](http://resources.woodlands-junior.kent.sch.uk/homework/tut.html)) and ([here](http://primaryhomeworkhelp.co.uk/news/index.htm)).
* National Geographic Kids website ([here](http://www.ngkids.co.uk/did-you-know/Tutankhamun-facts)).
* History for Kids website ([here](http://www.historyforkids.net/tutankhamun.html)).

**Achievements of the Ancient Egyptians*** Return to the KWL grid. What has been learned in this theme? Focus in on the achievements of the Ancient Egyptians, such as pyramids, hieroglyphs, the nilometer, the shaduf, mummification etc.
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| **Art and Design** |
| **Key Learning** |
| **Exploring and Developing Ideas*** Explore the roles and purposes of artists, craftspeople and designers working in different times and cultures.
* Question and make thoughtful observations about starting points and select ideas to use in their work.

**Drawing*** Experiment with ways in which surface detail can be added to drawings.
* Use journals to collect and record visual information from different sources.
* Draw for a sustained period of time at an appropriate level.
* Make marks and lines with a wide range of drawing implements e.g. charcoal, pencil, crayon, chalk pastels, pens etc.
* Experiment with different grades of pencil and other implements *(such as biros, charcoal and chalk)* to create lines and marks.
* Experiment with different grades of pencil and other implements to draw different forms and shapes.
* Begin to show an awareness of objects having a third dimension.
* Experiment with different grades of pencil and other implements to achieve variations in tone.
* Create textures with a wide range of drawing implements *(such as oil and chalk pastel).*

**Painting*** Experiment with different effects and textures including blocking in colour, washes, thickened paint creating textural effects.
* Work on a range of scales e.g. thin brush on small picture etc.
* Create different effects and textures with paint according to what they need for the task.

**Evaluating and Developing Work*** Compare ideas, methods and approaches in their own and others’ work and say what they think and feel about them.
* Adapt their work according to their views and describe how they might develop it further.
* Annotate work in journal.
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| **Art and Design** |
| **Creative Learning Opportunities and Outcomes** |
| Throughout this theme, children can explore and develop drawing and painting skills. It presents an opportunity to investigate many artists who have worked within the theme of water and to develop language skills to express opinions about an artist’s work, discuss their methods, and find differences and similarities between artists.Children could be introduced to the history of art and how artists such as Constable (view the gallery ([here](http://www.john-constable.org/))) and Hokusai (view the gallery ([here](http://www.katsushikahokusai.org/))) developed impressions of the sea. They could also consider how modern artists, from Monet’s later paintings of water lilies (view the gallery ([here](http://www.claudemonetgallery.org/))) to contemporary artists such as Adriana Brinsmead-Stockham (view the gallery ([here](http://www.glassrebel.com/gallery))), who works in glass, have used water as a stimulus to investigate abstract art.Research images of water and of artists using water as a theme to inspire the children and encourage them to experiment with more abstract ideas and images, investigating the scale of painting both large and small.**Drawing and Painting*** Children can make a series of observational drawings in journals/sketchbooks using photographs of dramatic water images such as waterfalls, floods, waves and/or droplets. Use whole composition to zoom in on an area of water.
* Encourage children to use a full range of drawing materials, including different grades of pencils, charcoal and chalk when making their drawings and use smudging techniques to help to create 3-D effects.
* Inspired by Monet, work on a larger scale perhaps with paint or coloured pastel. Try to capture the flow and energy of water by painting directly onto the picture surface. Children can be given the opportunity to work on a large scale either individually, or in groups.
* Develop drawings into other paintings to explore other paints e.g. watercolour and further work into with dry media such as pastels when dry to add depth and texture.
* Experiment with developing an abstract painting with texture. Children can use tissue paper, papier mâché or mod-roc on a small canvas or piece of cardboard, to explore a particular shape of water. Further paint can be added to the mod-roc if necessary. Small canvases could be displayed together to make a whole class abstract painting.

**Evaluating*** Encourage children to use their journal/sketchbook to refer back to their original ideas and incorporate these as their work progresses.
* Give children time to evaluate their work and that of others, describing what they like or might change next time, what materials they preferred using, and what advice they may give another artist.
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| **Additional Curriculum Links** |
| **Subject** | **Key Learning** | **Creative Learning Opportunities and Outcomes** |
| **Computing** | **Digital Research - Searching****Skills*** Use a range of child friendly search engines to locate different media, e.g. text, images, sounds or videos.
* Evaluate different search engines and explain their choices in using these for different purposes.
* Develop key questions and key words to search for specific information to answer a problem, e.g. a question such as ‘Where could we go on holiday?’ would become a search for ‘holiday destinations’.
* Consider the effectiveness of key questions on search results and refine where necessary.
* Use strategies to verify the accuracy and reliability of information, distinguishing between fact and opinion, e.g. cross checking with different websites or books.
* Use appropriate tools to save and retrieve accessed information, e.g. through the use of favourites, history, copy/paste and save as.
* Identify and cancel unwanted advertising, pop-ups and potentially malicious downloads by using the task manager function and NOT through buttons on the pop-up window, or the cross in the right hand corner.
* Know how to temporarily allow useful pop-ups from a website.
* Develop use of more advanced searching techniques, e.g. searching for a phrase using quotation marks to locate precise information.\*\*
* Choose the most appropriate search engine for a task, e.g. image search, search within a specific site or searching the wider internet.\*\*

**Knowledge and Understanding*** Talk about and describe the process of finding specific information, noting any difficulties during the process and how these were overcome.
* Understand that information found as a result of a search can vary in relevance.
* Begin to recognise that anyone can author on the internet and sometimes web content is inaccurate or even offensive.\*\* *(and OS)*
 | The learning within this theme reviews and expands upon the work on digital research carried out in the Rock and Roll theme in Year Three. It also introduces the children to the use of webpages. The areas of key learning that move on from those in Year Three include some of the more advanced features of search engines and developing the use of Boolean operators to refine searches and are indicated in the key learning section by \*\*.Alongside this learning is an increasing acknowledgement of copyright and the use of the internet. There is also an opportunity to link this to learning on how search engines work and what a webpage is which will be expanded further in upper KS2. These activities could support learning opportunities for any of the subjects covered in this theme, such as rivers in geography, the study of Ancient Egypt in history and states of matter in science.**Key topics and questions for discussion and review*** What examples of search engines do the children remember from Year Three?
* What are key words and key questions?
* How could you evaluate different search engines?
* What are ‘favourites’ and how would you use them?
* What does url stand for and what is it? A useful resource is available on the BBC Bitesize website ([here](http://www.bbc.co.uk/guides/zgx3b9q#zqcx6sg)).

The children will need some support to learn about Boolean operators and how a webpage is made. They can research and discuss what Boolean operators are and how can they be used to help us refine searches. Useful teacher resources include:* What is a search engine? on the BBC Webwise website ([here](http://www.bbc.co.uk/webwise/0/22562913)).
* Boolean operators on the BBC Bitesize website ([here](http://www.bbc.co.uk/bitesize/ks3/ict/data_and_information/searching_information/revision/3/)).
* Boolean - How to Find some or All of Your Search Terms in Google on the About website ([here](http://google.about.com/od/searchingtheweb/qt/booleantip.htm)).

Children can consider the following questions:* What is a webpage? on the BBC Bitesize website ([here](http://www.bbc.co.uk/guides/zgx3b9q#zctgr82)).
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| **Additional Curriculum Links** |
| **Subject** | **Key Learning** | **Creative Learning Opportunities and Outcomes** |
| **Computing****(contd.)** | * Understand that provision is made in schools to filter.
* Begin to understand the concept of copyright, e.g. what images, videos or sounds are legal and safe to use in their own work.\*\* *(and OS)*
* Begin to understand the need to acknowledge sources of information. *(and OS)*
* Understand when and where the internet can be used as a research tool.
* Know that Boolean search ‘operators’ can affect web searches.\*\*

**Design, Create, Manage and Manipulate Digital Content****Skills*** Use and combine internet services such as those that provide images, sounds, 3D representations and graphic software. This can include webpages.
* Recognise and use key layout and design features, e.g. text boxes, columns and borders (t*his can be any content e.g. webpages*).

**Knowledge and Understanding*** Recognise the features of good page design and multimedia presentations.
* Consider how design features meet the needs of the audience e.g. poster, newspaper, menu, instructions.
 | * What makes a good webpage? on the BBC Bitesize website ([here](http://www.bbc.co.uk/guides/zgx3b9q#zx8pn39)).
* What does a webpage look at and how could you make a page on the World Wide Web? Useful resource on the BBC Bitesize website ([here](http://www.bbc.co.uk/guides/zgx3b9q#z923b9q)).
* Why do certain webpages feature higher in search engines than other pages?

**Possible activities*** To reinforce learning on how to gather information effectively, children can search topics such as Ancient Egypt or rivers for appropriate information. They should use suitable key words and phrases and several different search engines to ascertain which is best for the search they want to do. They can also review some of the different media options they can search for, such as images. Copyright on images and information can be discussed. This will also be in the online safety activities.
* Children can develop their searches by using Boolean operators, starting by using quotation marks. This feature of search will developed further in upper KS2.
* The advanced features of search can be discussed and demonstrated by teachers, such as using Google Advanced search ([here](http://www.google.com/advanced_search)). This will be covered fully in subsequent years.
* Children can create digital content online for one element of the learning within this theme, e.g. states of matter in science, what makes a good webpage in computing or Ancient Egypt in history. Some of example of this would be:
* publishing blog pages.
* creating a page or pages on a content management system (CMS) website.
* creating a video or an animated movie and publishing it online in an appropriate format on a suitable website (e.g. safe school media streaming site).
* publishing on a wiki site.

Note the activities above allow the teacher to cover or review other areas of key learning depending on which activities are chosen. |

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| **Additional Curriculum Links** |
| **Subject** | **Key Learning** | **Creative Learning Opportunities and Outcomes** |
| **Computing****(contd.)** | **Online Safety****Skills*** Use technology responsibly
* Recognise acceptable behaviour
* Recognise unacceptable behaviour.
* Know what to do and who to tell if they discover something inappropriate or offensive on a website, at home and in school.

**Knowledge and Understanding*** Know how to use technology responsibly.
* Understand the risks posed by the internet relating to content e.g. violent and biased websites.
* Know a range of ways to report concerns about content.
* Understand what acceptable online behaviour is.
* Understand what unacceptable online behaviour is.
* Understand that online actions can impact on other people.
* Know what images are suitable to include in an online profile and ensure that appropriate permissions have been obtained, e.g. copyright or asking friends before uploading their images.
* Know the school’s rules for keeping safe online and be able to apply these beyond school.
 | **Extension*** The children will have some understanding about webpages and possibly how to use them to publish their work. It is important to show them how the pages ‘work’ by looking at the code ‘behind’ the page.
* Demonstrate how to create webpages and the code behind the page.
* Children could be allowed to explore or play with the code on the pages ([here](http://www.codecademy.com/courses/web-beginner-en-LceTK/0/1)) on the Code Academy website.
* What about coding? A useful resource to support coding webpages on the BBC Bitesize website ([here](http://www.bbc.co.uk/guides/zgx3b9q#z2gq7ty)).

There are many opportunities for reinforcing the messages regarding online safety within this digital research and key learning from digital search that is particularly linked has been identified in the previous column. These activities will develop the children’s knowledge of the acceptable and unacceptable use of content on the internet. This will look at the copyright associated with websites, including images and other content, and develop an understanding about resources that are more suitable to use. Children should also learn that not all of the websites and resources found from their searches will be appropriate for them to use.**Areas for discussion*** What is copyright?
* How can the author of a piece of content be acknowledged?
* Is everything seen on the World Wide Web accurate?
* How is it possible to find out whether the information is reliable?
* What does the word biased mean?
* What would a biased website be?
* What are violent websites?
* If they saw content that was unsuitable (e.g. violent) what would they do?
* What is web filtering and why do schools have it?
* What tools do web browsers have to help with searching safely (e.g. Google Safe Search)?
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| **Additional Curriculum Links** |
| **Subject** | **Key Learning** | **Creative Learning Opportunities and Outcomes** |
| **Computing****(contd.)** |  | Wikipedia will have a high ranking on many of the searches carried out by the children. Understanding how this website works and how the pages are created and edited is important as it allows the children to make a more informed judgment on the content. Children can consider:* What is Wikipedia and how are pages created and edited on this website? See Wikipedia ([here](http://en.wikipedia.org/wiki/Main_Page)).
* Have they ever used the Simple English Wikipedia? What is it? See Wikipedia ([here](http://simple.wikipedia.org/wiki/Main_Page)).
* What is Wikimedia and how does it help us when we are looking for images to use in our work? See Wikimedia ([here](https://www.wikimedia.org/)).

**Possible activities*** Children can compare information on Ancient Egypt or another area of learning, from Wikipedia and the Simple English Wikipedia. Which source of information is the most appropriate? What copyright do the images on this page have? Children can find these and note it down for a discussion on what it means. *(There should be an image of the Great Sphinx. Clicking on images on these sites allows you to see their copyright information.)*
* Children can prepare a list, leaflet or booklet on how to search and check for reliable information on the internet, ensuring they explain what the word biased means.
* Fact or Fiction: children can prepare facts about their learning in other subjects within this theme, some of which are correct and some wrong. They can then test the class with these facts and vote on whether they are right or wrong.

**Useful resources for teachers*** What is copyright all about? on the Copy Rights and Wrongs website ([here](http://www.copyrightsandwrongs.nen.gov.uk/students/what-is-copyright-all-about)).
* Schools and copyright on the Copy Rights and Wrongs website ([here](http://www.copyrightsandwrongs.nen.gov.uk/schools-a-copyright)).
* Reliability of Wikipedia from Wikipedia ([here](http://en.wikipedia.org/wiki/Reliability_of_Wikipedia)).
* ‘Iffy-pedia: Up to six in ten articles on Wikipedia contain factual errors’ article from the Daily Mail website ([here](http://www.dailymail.co.uk/sciencetech/article-2131458/Up-articles-Wikipedia-contain-factual-errors.html)).
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| **Additional Curriculum Links** |
| **Subject** | **Key Learning** | **Creative Learning Opportunities and Outcomes** |
| **Mathematics** | **Number – number and place value*** Read and write numbers to at least 10 000.
* Read and write numbers with up to two decimal places.
* Order and compare numbers beyond 1000.
* Order and compare numbers with the same number of decimal places up to two decimal places.

**Number - addition and subtraction*** Add and subtract mentally combinations of two and three digit numbers and decimals to one decimal place.
* Add and subtract numbers with up to four digits and decimals with one decimal place using the formal written methods of columnar addition and subtraction where appropriate.

**Geometry - properties of shapes*** Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.

**Measurement** * Order temperatures including those below 0°C.
* Estimate, compare and calculate different measures.
* Measure the perimeter of simple 2-D shapes *(from Year Three).*

**Statistics*** Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts, time graphs.
 | Linked to learning opportunities in science where children are estimating the temperature of a variety of objects, there are opportunities to work with this information in a variety of ways:* Ordering their estimates from coldest to hottest.
* Accurate reading of thermometers to ascertain the correct temperatures *(developing and securing skills from Years Two and Three).*
* Ordering the actual temperatures from coldest to hottest.
* Calculating the difference between their estimate and the actual temperature for each one; identifying their most and least accurate measurements and suggesting why this might be the case (some of the facts they may know and some of the objects they may be more familiar with than others).

Linked to learning opportunities in both science and geography, where children are using dataloggers, there is an opportunity to secure their understanding of comparing and ordering decimal numbers and using this in context. This may be when looking at measurements such as river flow or temperatures of melting ice sculptures. Children should be given opportunities to order these numbers, identifying the appropriate place for each and which measurements are coldest or hottest.Linked to learning opportunities in geography, children could use their river research to create their own sets of ‘Top Trump’ style cards for rivers. They could consider the river length, how many countries it flows through and how many tributaries it has. The cards could be created on paper or by using the Top Trump It app ([here](https://itunes.apple.com/gb/app/top-trump-it-make-your-own/id883195589?ls=1&mt=8)). Creating and playing the game will enable them to compare and order numbers beyond 1000.Linked to learning opportunities in science, there are a number of opportunities for children to develop their understanding of time graphs (also known as line graphs). It is important that children know it is only appropriate to use a time graph when the data collected is connected in some way and the intermediate points have meaning. Discuss with the children what continuous data is.  |

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| **Additional Curriculum Links** |
| **Subject** | **Key Learning** | **Creative Learning Opportunities and Outcomes** |
| **Mathematics****(contd.)** |  | Provide the following list:* Ice creams sold.
* Temperature in the classroom.
* Dolphin sightings.
* Scores in a test.
* Mass of a baby.

Can children identify which of them would be appropriate to show on a line graph? The only ones are the temperature and mass because as they change they have to pass through intermediate points which mean something. If the number of ice creams sold was plotted on a line graph with 30 ice creams sold on Monday and 10 sold on Wednesday, the line graph would suggest that 20 were sold on Tuesday. This would be an inappropriate assumption due to the events being unconnected.Children could construct time graphs for the experiments measuring:* Line graph of kettle boiling - (it is important to consider **health and safety**). Use a data logger in a kettle and plot the readings. Children could determine the appropriate spacing of the readings, for example, every second is unmanageable but every minute will only offer a couple of readings before the water boils).
* Melting ice sculptures - measuring the circumference of the ice (or the volume of the melt water) every thirty minutes.
* Snowman with coats - measuring the volume of the melt water for each ‘snowman’ at appropriate intervals of time and creating a time graph for each.
* Measuring puddles over time - measuring the perimeter of the puddle at appropriate intervals.

For each of the graphs above, children should be able to interpret them to identify both plotted and intermediate points from both axes. They should also answer questions such as:* How much hotter was the water at 45 seconds than at 30 seconds?
* How much did the perimeter of the puddle decrease between eleven o’clock and three o’clock?
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| **Additional Curriculum Links** |
| **Subject** | **Key Learning** | **Creative Learning Opportunities and Outcomes** |
| **Mathematics****(contd.)** |  | Linked to learning opportunities in history, children can consider what they know about pyramids and is an opportunity to dispel the myths that all pyramids look like those in Egypt! Ask children to visualise a pyramid. They should then describe it to their partner focusing on the following:* Faces (number and shapes).
* Edges (number and orientation).
* Vertices (number and position).
* What it would look like from the side, above and below.

They should then discuss with their partner and wider group to create a definition of a pyramid. Take feedback.Show the children a pyramid standing on its apex, such as this one:Rectangular PyramidRectangular PyramidAsk children whether they think there are other forms of pyramid. Take feedback before showing the following:Pentagonal Pyramid  Octagonal Pyramid *Octagonal**based pyramid**Pentagonal**based pyramid*Are these pyramids? Do they match the initial definition? Ask children to revise their definition, if required, so that it includes these new shapes.*Square based pyramid*Repeat with the pyramids below, these are particularly important if children decided in their previous definition that the base was a regular shape.http://etc.usf.edu/clipart/43100/43198/quad23_43198_md.gif http://www.mathe-schumann.de/tokyo/Image37.gifFinally, consider the following two shapes. Are both of these pyramids? The shape on the left is an oblique pyramid. This is the name for any pyramid where the apex is not directly over the centre of the base. Refine their definition again and compare with the mathematical definition on the Maths is Fun website ([here](https://www.mathsisfun.com/definitions/pyramid.html)). This type of activity can be carried out with other 2-D and 3-D shapes to deepen knowledge and understanding. |

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| **Additional Curriculum Links** |
| **Subject** | **Key Learning** | **Creative Learning Opportunities and Outcomes** |
| **Music** | **Performing*** Sing songs, speak chants and rhymes in unison and two parts, with clear diction, control of pitch, a sense of phrase and musical expression.
* Play tuned and untuned instruments with control and rhythmic accuracy.
* Practise, rehearse and present performances with an awareness of the audience.

**Listening*** Listen with attention to a range of high quality live and recorded music, to detail and to internalise and recall sounds with increasing aural memory.
* Experience how the combined musical elements of pitch, duration, dynamics, tempo, timbre, texture and silence can be organised within musical structures (for example, ostinato) and used to communicate different moods and effects.
* Know how time and place can influence the way music is created, performed and heard (for example, the effect of occasion and venue).

**Creating*** Improvise and develop rhythmic and melodic material when performing.
* Explore, choose, combine and organise musical ideas within musical structures.

**Knowledge and Understanding*** Analyse and compare sounds.
* Improve their own and others' work in relation to its intended effect.
* Develop an understanding of the history of music.

**Pitch*** Determine upwards and downwards direction in listening, performing and moving.
 | Within this theme, children will create music and musical instruments using water. By using various amounts of water they can identify how different pitches are created. Instruments can then be performed in an outdoor assembly or to another class as part of a final project.* Show children what is possible by watching performances of ‘Hallelujah’ on YouTube ([here](https://www.youtube.com/watch?v=lAEXH9DAH98)) and ‘Sabre Dance’ on YouTube ([here](https://www.youtube.com/watch?v=tOEjPF3rJAY)). Discuss the techniques the musicians use and how the different amounts of water allow them to tune each glass or bottle to a specific pitch.
* Supervise an outdoor water bath and allow children to experiment with playing different materials in water. These may include aluminium bowls, pan lids, pipes, plastic bottles, buckets and shakers. An example of this can be seen on the Child’s Play Music website ([here](http://childsplaymusic.com.au/2012/01/17/water-play-music-play-children-a-natural-combination/)).
* Children can create their own water glass instrument. Ideas on creating these can be found on YouTube ([here](https://www.youtube.com/watch?v=Nj1ZTBWkTcE)) or ([here](https://www.youtube.com/watch?v=fRfVEXq-k38)) or the Connections Academy website ([here](http://www.connectionsacademy.com/blog/posts/2013-03-22/Experiment-with-Musical-Water-Glasses.aspx)). Children should be supervised whenever they are working with glass, so this may need to be led by an adult.
* Children could create water pipe instruments such as the ones on YouTube ([here](https://www.youtube.com/watch?v=zauGYfy3dDM)) or ([here](https://www.youtube.com/watch?v=EMiB4N1zYi0)).
* It is also possible to create music from water in a different way, using blowing rather than beating. An idea for making water flutes using plastic bottles can be found on the Scientific American website ([here](http://www.scientificamerican.com/article/sonorous-science-making-music-with-bottles/)).
* The YouTube clips ([here](https://www.youtube.com/watch?v=ZctqhSMuA60)) and ([here](https://www.youtube.com/watch?v=8NwN3DC-r60)) both have examples of sound being created by a water gong. Children could create their own water gongs using a water bath and various metal lids.
* Throughout the activities above, consider the following:
* Are children able to compose their own melodies?
* Can they create various low and high sounding pitches?
* Is their instrument able to play different volumes (loud and quiet dynamics)?
* Can they identify ways in which the sound can be improved?
* Can they identify what happens if they vary the amount of water or size of the object making the sound?
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| **Additional Curriculum Links** |
| **Subject** | **Key Learning** | **Creative Learning Opportunities and Outcomes** |
| **Music (contd.)** | * Recognise and imitate melody patterns in echoes.
* Show the overall contour of melodies as moving upwards, downwards or staying the same.
* Determine movement by step, by leaps or by repeats.
* Perform simple melody patterns.

**Duration*** Indicate the steady beat by movement, including during a silence.
* Respond to changes in the speed of the beat.
* Respond to the strong beats whilst singing.
* Use instruments to keep a steady beat.

**Dynamics*** Recognise differences in dynamic levels.

**Tempo*** Identify the differences between fast and slow tempos.
* Identify the tempo of music as fast, moderate, slow, getting faster or getting slower.

**Timbre*** Describe and aurally identify the tone colours of instruments.
* Compare instrumental tone colour.

**Texture*** Recognise the difference between thick (many sounds) and thin (few sounds) textures.
* Recognise changes in texture.
* Identify the melodic line in a texture.
* Recognise the difference between unison (one same pitched sound) and harmony (various pitched sounds at the same time).
 | * Listen to the following pieces of water inspired music:
* George Frideric Handel ‘Water Music’ on YouTube ([here](https://www.youtube.com/watch?v=UcknsYVgdkM)).
* Felix Mendelssohn ‘Hebrides Overture’ on YouTube ([here](https://www.youtube.com/watch?v=CvWezBIUDtg)).
* Henry Wood - Fantasia on British Sea Songs – ‘Sailor’s Hornpipe’ on YouTube ([here](https://www.youtube.com/watch?v=9cZyNtZtSqE)).
* Rimsky-Korsakov – ‘The Sea and Sinbad’s Ship’ from Scheherazade on YouTube ([here](https://www.youtube.com/watch?v=sTIUf1NzAiU)).
* Eric Coates ‘By the Sleepy Lagoon’ on YouTube ([here](https://www.youtube.com/watch?v=gK-byzdp-DQ)).
* Edward Elgar - Sea Pictures ‘Sea Slumber Song’ on YouTube ([here](https://www.youtube.com/watch?v=V6hMqZEv_d4)).
* When listening to the pieces investigate the following musical elements:
* What gives the listener the impression of water?
* Can children investigate online why each composer was inspired to write music about their water theme?
* Can children hear the melody? Are they able to describe it or hum it back?
* Which instruments play or sing the melody? Which instruments play the accompaniment?
* Notate the direction of the melody by drawing lines to represent what is heard – high long lines for high sustained melodies, low short lines for low pitched detached melodies.
* Can children recognise the beat and clap along in time? Do they recognise when music quickens up or slows down?
* Can children explain in musical terms what happens to the dynamics (volume) of the music? Do dynamics change gradually or suddenly?
* What instruments can children see/hear from the performances? What family of instruments do they belong to?
* How many instruments play at any given moment? When does the texture of the music thin out to a soloist or only a few instruments playing?
* End sessions by singing the following water inspired songs. Rehearse for clear diction, control of pitch, a sense of phrase and musical expression.
* Listen to the Water on YouTube ([here](https://www.youtube.com/watch?v=PC45IksR-K4)).
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| **Additional Curriculum Links** |
| **Subject** | **Key Learning** | **Creative Learning Opportunities and Outcomes** |
| **Music (contd.)** | **Structure*** Recognise call and response form.
* Differentiate between the contrasting sections of a song.
* Recognise the difference between the verse and refrain of a song.
* Recognise binary (one melody labelled ‘A’ is followed by a new melody labelled ‘B’ = AB melody form) and ternary (one melody labelled ‘A’ is followed by a new melody labelled ‘B’ which then goes back to melody A = ABA melody form) form.
 | * The Water Cycle Song on YouTube ([here](https://www.youtube.com/watch?v=T05djitkEFI)) with lyrics on YouTube ([here](https://www.youtube.com/watch?v=u3QwLYfgwP0)).
* We Love the Water on YouTube ([here](https://www.youtube.com/watch?v=IOLlw-GKpVs)).
* The Water Is Wide on YouTube ([here](https://www.youtube.com/watch?v=ujhQXuLthwQ)).
* Bridge over Troubled Water by Simon and Garfunkel on YouTube ([here](https://www.youtube.com/watch?v=jjNgn4r6SOA)).
* Waterfront by Simple Minds on YouTube ([here](https://www.youtube.com/watch?v=gCN8FMycVVA)) with lyrics on the AZ Lyrics website ([here](http://www.azlyrics.com/lyrics/simpleminds/waterfront.html)).
* Children should identify the following structural elements:
* Recognise call and response form. The Simple Minds song would be a good choice for practising call and response singing.
* Differentiate between the contrasting sections of a song by identifying the verse and chorus (refrain).
* Recognise binary (AB) and ternary (ABA) forms of melody.
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| **English** |
| **Key Learning** |
| **Unit** | **Stories with a Theme** | **Poems with a Structure** | **Information Booklets** |
| **Outcome** | * Narrative based on text read.
 | * Poem with a structure linked to the theme of water.
 | * Booklet of information e.g. welcome brochure.
 |
| **Possible Duration**  | * 3-4 weeks.
 | * 1-2 weeks.
 | * 2-3 weeks.
 |
| **Key Learning****Reading**  | * Listen to, read and discuss a range of fiction.
* Analyse and evaluate texts looking at language, structure and presentation.
* Retell a range of stories.
* Identify, discuss and collect effective words and phrases which capture the reader’s interest and imagination e.g. *metaphors, similes.*
* Explain the meaning of key vocabulary within the context of the text.
* Make predictions based on information stated and implied.
* Demonstrate active reading strategies e.g. *generating questions, finding answers, refining thinking, modifying questions, constructing images.*
* Draw inferences around characters’ thoughts, feelings, actions and motives, and justify with evidence from the text using point and evidence.
* Develop, agree on and evaluate rules for effective discussion.
* Make and respond to contributions in a variety of group situations e.g. *whole class, independent reading groups, book circles.*
 | * Use suffixes to understand meanings e.g. –*ssion, -cian.*
* Listen to, read and discuss poetry in different forms.
* Analyse different forms of poetry e.g. *haiku, limericks, kennings.*
* Identify, discuss and collect effective words and phrases which capture the reader’s interest and imagination e.g. *metaphors, similes.*
* Learn a range of poems by heart and rehearsing for performance.
* Prepare poems to read aloud, showing understanding through intonation, tone, volume and action.
* Explain the meaning of key vocabulary within the context of the text.
 | * Use prefixes to understand meanings e.g*. sub-, inter-.*
* Read and understand meaning of words on Year Three/Four word list.
* Use punctuation to determine intonation and expression when reading aloud to a range of audiences.
* Listen to, read and discuss a range of non-fiction in different forms e.g., *brochures, leaflets, electronic texts.*
* Analyse and evaluate texts looking at language, structure and presentation.
* Read books and texts for a range of purposes and respond in a variety of ways.
* Explain the meaning of key vocabulary within the context of the text.
* Identify main ideas drawn from more than one paragraph and summarise these.
* Analyse and evaluate how specific information is organised within a non-fiction text e.g. *text boxes, sub-headings, contents, bullet points, glossary, diagrams.*
* Scan for dates, numbers and names.
* Explain how paragraphs are used to order ideas, and how they are linked.
* Navigate texts to locate and retrieve information in print and on screen.
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| **English** |
| **Key Learning (contd.)** |
| **Key Learning****Writing**  | * Explore, identify, collect and use noun phrases e.g. *The crumbly cookie with tasty marshmallow pieces melted in my mouth.*
* Create sentences with fronted adverbials for wheree.g*. In the distance, a lone wolf howled.*
* Use commas to mark clauses in complex sentences.
* Read and analyse narrative, in order to plan and write their own.
* Discuss and record ideas for planning e.g. *story mountain, story map, text map, non-fiction bridge, story board, boxing-up.*
* Develop settings and characterisation using vocabulary to create emphasis and atmosphere.
* Link ideas within paragraphs e.g. *fronted adverbials for where.*
* Generate and select from vocabulary banks e.g*. powerful adverbs, adverbial phrases, technical language, persuasive phrases, alliteration* appropriate to text type.
* Proofread to check for errors in spelling, grammar and punctuation in own and others’ writing.
 | * Use apostrophes for singular and plural possession e.g. *the dog’s bone and the dogs’ bones.*
* Read and analyse poetry in order to plan and write their own.
* Identify and discuss the purpose, audience and language structure in poetry for writing.
* Generate and select from vocabulary banksappropriate to text type.
* Proofread to check for errors in spelling, grammar and punctuation in own and others’ writing.
* Discuss and propose changes with partners and in small groups.
* Improve writing in light of evaluation.
* Use appropriate intonation, tone and volume to present their writing to a range of audiences.
 | * Use commas to mark clauses in complex sentences.
* Read and analyse non-fiction in order to plan and write their own.
* Identify and discuss the purpose, audience, language and structures of narrative, non-fiction and poetry for writing.
* Discuss and record ideas for planning e.g. *story mountain, story map, text map, non-fiction bridge, story board, boxing-up text types to create a plan.*
* Organise paragraphs in non-fiction.
* Generate and select from vocabulary banks e.g*. technical language, persuasive phrases, alliteration* appropriate to text type.
* Proofread to check for errors in spelling, grammar and punctuation in own and others’ writing.
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| **Suggested Texts**  | * The Mousehole Cat by Antonia Barber.
* Jackanory Junior: The Mousehole Cat told by Shobna Gulati on YouTube ([here](https://www.youtube.com/watch?v=cMnhH_wG-e4)).
* The Mousehole Cat: Animated Story on YouTube ([here](https://www.youtube.com/watch?v=w3sOZT-n98s)).
* The Water Horse by Dick King-Smith.
* The Water Horse: Legend of the Deep DVD.
* A River Ran Wild by Lynne Cherry.
* The Little Mermaid by Hans Christian Andersen.
* Maui and the Big Fish by Barbara Ker Wilson.
 | * Water Dance by Thomas Locker *(riddles)*.
* Water Water Everywhere by James Casey on the Poem Hunter website ([here](http://www.poemhunter.com/poem/water-water-everywhere/)).
* Poems for the Geography Classroom by Mark Cowan.
* How to Write a Haiku on the Poetry for Kids website ([here](http://www.poetry4kids.com/blog/lessons/how-to-write-a-haiku/)).
* Kennings on the Angela’s Poems website ([here](http://www.angelaspoems.com/teacherspage/different-poetry-forms/kennings/)).
* Kennings on the Poetry Zone website ([here](http://poetryzone.co.uk/childrens-archive/kennings/)).
 | * Information books, leaflets and websites linked to water.
* Water Dance by Thomas Locker *(information at the end of book).*
* Mousehole on the Visit Cornwall website ([here](https://www.visitcornwall.com/places/mousehole#.VP5SF3ysVu5)).
* Places to Visit on the Canal and River Trust website ([here](https://canalrivertrust.org.uk/places-to-visit?location=chorley&range=0&submit=Search#anch:resultshttps://canalrivertrust.org.uk/places-to-visit?location=chorley&range=0&submit=Search)).
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| **English** |
| **Stories with a Theme – Creative Learning Opportunities and Outcomes** |
| **Creating interest*** Using a focus text such as *The Mousehole Cat* by Antonia Barber, the teacher introduces themselves in role as the main character. For example, in role as Mowzer the Mousehole Cat, telling the class where you live, what you eat and any other details.
* Show the children some food items that Mowzer and other cats eat. Model describing the foods Mowzer eats on each day of the week e.g. *Monday – eggs – scrambled, boiled or fried with pepper on top.* Use noun phrases to describe the items.
* Question the children - *What do you eat on Monday? Tuesday?* etc.
* Begin to generate a noun phrase bank and continue to add ideas to support writing a food diary.
* Display Mowzer’s menu for the week e.g*. Monday – fish stew, Tuesday – hake topped with golden mashed potatoes etc.* Identify the items from the text or other items Mowzer might like.
* In role, model writing your food diary for the week with some noun phrases. Provide a short writing opportunity for the children: write a food diary or menu for yourself and/or Mowzer with noun phrases.
 | **Learning outcomes** * Children will be able to generate ideas.
* Children will be able to generate, select and use noun phrases.
 |
| **Reading** **Grammar:** Warm ups throughout the reading phase - focus on identifying, generating and using noun phrases for description.**Reading and responding** * Alongside the unit, read a class novel such as *The Water Horse* by Dick King-Smith.
* View the opening to *The Mousehole Cat* on YouTube ([here](https://www.youtube.com/watch?v=w3sOZT-n98s)).
* Model the use of a drama technique to develop understanding and vocabulary e.g. *in role as a nosy neighbour; a pilot flying over the setting; or a spotter - looking through binoculars or glasses from above*. Use a speaking frame to support the children in articulating, in role, what they might be able to see, e.g. *I can see… and I can hear … (mist, clouds, sea, crashing waves at edge of the cliffs).*
* Provide a focus box to capture ideas via a short writing opportunity. Share and collect ideas from others in the class:

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| **I can see** | **I can hear**  |
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* Collect ideas from the clip, and develop further into sentences with noun phrases through scaffolding vocabulary and ideas e.g. *I can see mist across the mountains; I can see water splashing down below; I can hear the wind whistling around the cliff tops.*
* After shared reading of the first part of the story, model identifying words for discussion via a spotters approach e.g. *I have spotted these words which I would like to discuss: harbour and patchwork.*
 | **Learning outcomes** * Children will be able to identify noun phrases.
* Children will be able to use noun phrases for description.
* Children will be able to listen to a class novel and respond.
* Children will be able to listen to a text presented via storytelling.
* Children will be able to develop responses via drama techniques and capture in writing.
* Children will be able to identify vocabulary for discussion, use a dictionary to look up meanings and explain in context.
* Children will be able to generate questions to answer as an aid to summarising.
* Children will be able to identify key points and use evidence from the text.
* Children will be able to take on the role of a character and use evidence from the text to act in role.
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| **English** |
| **Stories with a Theme – Creative Learning Opportunities and Outcomes (contd.)** |
| * Model explaining the meaning of key vocabulary spotted within the context of the text by using a dictionary to look up and display the definition e.g. *harbour – a place on the coast where vessels may find shelter.*
* Provide potentially unfamiliar vocabulary from the next section of the text and challenge children, in small groups, to explore prior to the shared reading of that section. Place the words from the text, e.g. *quayside, narrow, breakwater, stoked, partial, variety* in envelopes with definitions for children to read and match as a group. For some groups it may be more appropriate to have the words within sentences with the focus word underlined.
* Through shared reading, explore the next section of the story and when the children hear their word, they hold up their vocabulary card and definition, read it out and discuss. Following this, through discussion and modelling, consider the word in the context of the text.
* Discuss the events as a class using the 'questionator' challenge. This involves posing a question then using talk partners to generate responses within a short time limit e.g. *What do you know so far? What do you know about Mowzer? What does he eat? What does he do? What do you know about Tom? What does he do?*
* Capture responses via a short writing opportunity e.g*. character web with an image of Mowzer in the centre with the details generated around the image.*
* Through *s*hared reading, explore the section about Mowzer’s kittens and Tom.
* Develop understanding via point and evidence using a ‘Who am I?’ drama technique. This involves providing a range of response statements from the perspective of different characters e.g. *I don’t like beer being spilled on my head; I run the Inn on the Quayside – Answer: the oldest kitten. I am sometimes lonely; I wonder how the kittens are; I love the fisherman I live with – Answer: Mowzer.*
* In role as the character, model saying the statements one by one and ask children to predict, then guess, then firm up their decision, justifying views with evidence.
* Children work in pairs create their own ‘Who am I?’ quiz for characters such as Fisherman Tom, the kitten daughter, or Mowzer and challenge other pairs to predict, decide, then justify in a short writing task.
* Begin to create a whole class story map to summarise the events so far e.g. *the cliffs, Mowzer, cottage, Fisherman Tom, kittens, boat and the sea, foods from Monday to Sunday etc.* Support with props, images from the story or screen shots from the film.
* Add key vocabulary and phrases to the map as reminders for retelling.
* Model retelling the events so far via oral storytelling, before children retell to a partner.
* Continue this throughout the reading phase until the whole story is mapped and retold using visual prompts.
* Read and/or view the next section of the story e.g. *when the storm occurs* on YouTube ([here](https://www.youtube.com/watch?v=w3sOZT-n98s)).
* Model identifying favourite words and phrases which capture your interest; include similes and metaphors; ask children to jot theirs on a sticky note and place them to create a carpet of words e.g. *the wind whined like a wild thing, the stone walls shook, the sea sucked up, the fishing boats sat safe as mice.*
 | * Children will be able to sequence and discuss events using story mapping.
* Children will be able to identify the text type features of an adventure narrative.
* Children will be able to identify the plot structure of a narrative.
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| **English** |
| **Stories with a Theme – Creative Learning Opportunities and Outcomes (contd.)** |
| * Select sticky notes to discuss and explain the use of similes, metaphors and noun phrases as appropriate.
* Read and view next section of the story where Tom goes out into the ocean to fish – discuss the events.
* Divide the class into three groups, assigning each group a role: Tom, Mowzer and the villagers. Set up a scenario that Tom has gone out to sea without any word back to the village.
* Use teacher in role as a news reporter on the scene in the village and interview Mowzer and the villagers. Ask about what has happened, the characters’ thoughts, feelings and motives e.g*. Why do you look so worried? Where has Tom gone? Why? He never usually leaves Mousehole so why now? How do you feel? What are you thinking?*
* Repeat for Tom as a reporter via a helicopter over the sea.
* Choosing one of the characters, model writing the opening to a diary focusing on the events, thoughts, feelings and motives using the responses collected. Children write their own diary entry in role.

**Reading and analysing*** Return to the story map created in the reading and responding phase e.g. *setting of the story, introduction of main character(s), foods Mowzer likes to eat, water causes problems, no food available, character goes out to find food for the villagers, a storm occurs, character brings home food and the villagers feast again.*
* Model using the story map to create a plot pattern e.g.

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| **The Mousehole Cat** | **Extract the plot pattern** | **New plot innovation** |
| Setting of Mousehole. | Setting description. |  |
| Introduction of Mowzer. | Introduction of main character. |  |
| More details about the village and villagers in Mousehole. | Introduction of other characters.  |  |
| Storm occurs so no food available. | Problem in story so no food available. |  |
| Tom goes fishing in the storm. | One character goes to find food. |  |
| Tom returns and villagers feast again. | Character returns and villagers are no longer hungry. |  |

* Model creating a writer’s toolkit for the opening sections of the story through analysis of the text.
* Provide further openings to stories for children to read and analyse to examine how an author introduces settings and characters e.g. *The Water Horse* by Dick King-Smith.
* Collate ideas and display on the working wall.
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| **English** |
| **Stories with a Theme – Creative Learning Opportunities and Outcomes (contd.)** |
| **Gathering content** **Grammar:** Warm ups throughout the gathering content phase -focus on fronted adverbials for ‘where’. * Develop a new plot based on the focus text analysed.
* Model developing new characters and setting as a class.
* Focus on each aspect of the new plot using visual images and props to develop ideas e.g. *use a story box of ideas to provide stimulus – range of characters, setting linked to water.* Model selecting from the box to organise ideas into the new plot structure. Children select their own in pairs or small groups.
* Use freeze framing, or a 'sculpt and sculptor' drama technique to model a ‘picture’ for each section of the plot. Sculpt and sculptor involves the ‘sculptor’ in physically moving the limbs of the characters, and instructing them about how to stand or sit; facial expressions etc. Capture this image using ICT e.g. *iPad or digital camera*. Use the images to create a storyboard following the plot structure.
* Images can be used to further develop ideas for each section of the plot. Note ideas, character details and vocabulary linked to each key event in small groups, following modelling.
* Develop language further for each section of the story by selecting a sentence which needs improving with specific language choices, sentence openers and noun phrases. For example, changing '*There were clouds above the hills and the wind whistled around'* to '*Clouds danced over the hills and the wind whistled around the bay'.*
* Allocate images from the plot structure for each group to read and improve with vocabulary collected from the unit.
* Lay out all the images in a sequence and children perform their improved sentences as a group to create a whole class presentation. Create a PowerPoint or Photostory outcome, if desired.
 | **Learning outcomes*** Children will be able to create ideas for a new story, using a plot structure.
* Children will be able to identify thoughts and feelings of characters.
* Children will be able to generate dialogue between characters.
* Children will be able to use inverted commas to demarcate dialogue between characters.
 |
|  **Writing** * Use shared writing techniques to model a paragraph or section at a time referring to each section of the plan. Focus on skills – noun phrases and fronted adverbials for ‘where’.
* Use AFL, marking and feedback to adjust shared writing focus daily.
* Model proofreading to check and improve spelling, grammar and punctuation.
* Children proofread their own and others’ writing with a specific focus e.g. *success criteria toolkit, spelling, punctuation etc.*
 | **Learning outcomes*** Children will be able to write a narrative based on a plot using:
* noun phrases within sentences.
* fronted adverbials for ‘where’.
* elements of the writer’s toolkits created.
 |
| **Outcome** * Narrative based on a focus text.
 |
| **Presentation** * Publish story for display or in a class book of stories and place in class or school library.
* Read to an audience e.g. parent, other child in the same class.
 |
| **English** |
| **Poems with a Structure – Creative Learning Opportunities and Outcomes** |
| **Creating interest*** Provide a short film of water moving such as this one on Vimeo ([here](https://vimeo.com/30830412)).
* Model generating vocabulary focusing on verbs to describe the water in the clip e.g. *splashing, curling, blowing, circling, twinkling, bursting, racing, dashing.* As a challenge, include some verbs which involve personification e.g. *singing, shouting, laughing.*
* Provide thesauruses for children to select a verb and find synonyms. In a pair or small group, record the words on a shades of meaning card (paint charts from DIY shops are suitable for these).
* View the clip again and use a start, stop, shout out technique where children are asked to shout out an appropriate word which matches the clip when it is paused.
* Create a whole class mini poem by allocating the verbs to different images in the clip. Children say these at the appropriate time as the clip is played.
* Following modelling, children create their own e.g.

**Water** burstingbargingcrashingbubblingflowing twinkling circling gigglingdripping dropping surfing curlingexploding andsleeping | **Learning outcomes** * Children will be able to generate vocabulary and collect favourite words and phrases.
 |
| **Reading** **Grammar:** Warm ups throughout the reading phase – focus on suffixes *-ssion* and *-cian.***Reading and responding** * Model reading a range of poems linked to water, such as ‘Water Dance’ by Thomas Locker, using appropriate intonation and expression. Collect useful vocabulary.
 | **Learning outcomes*** Children will be able to read and discuss words with suffixes *-ssion* and *-cian.*
* Children will be able to listen to a poetry reading and provide an opinion with reasons.
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| **English** |
| **Poems with a Structure – Creative Learning Opportunities and Outcomes (contd.)** |
| * Read haiku and/or kennings poems such as the ones on the Poetry for Kids website ([here](http://www.poetry4kids.com/blog/lessons/how-to-write-a-haiku/)), the Angela’s Poems website ([here](http://www.angelaspoems.com/teacherspage/different-poetry-forms/kennings/)) or the Poetry Zone website ([here](http://poetryzone.co.uk/childrens-archive/kennings/)).
* Involve children in discussing their responses to the poems. Use open-ended response hooks/speaking frames in pairs, small groups or whole class e.g. *Tell me what you enjoyed about the poem. Why? Tell me what you didn’t like. Why? Which part did you like best? Why?*

**Reading and analysing** * Through shared reading, explore a selected haiku poem or write one for use with the children e.g.

 *Mousehole Cat lives here.* *Eating, sleeping, watching near.* *Caring Mousehole cat.* * Identify the structure of the poem e.g. *haiku – 5 syllables, 7 syllables, 5 syllables.* Read the poem and ask children to clap the syllables as it is read. Repeat with one child saying the poem to a partner whilst the partner claps.
* Children read a range of haiku poems in pairs to examine the structure further.
* Provide opportunities for response by asking questions such as:
* Which is your favourite? Why?
* Which would you recommend for others to read?
* How many stars out of five would you give it?
* Provide a short writing opportunity for children to write a poem review. Share poems, reviews and recommendations on posters.
* Repeat with kennings poems if desired.
 | * Children will be able to identify ways to perform a poem which engage the listener.
* Children will be able to identify the structure of a poem.
* Children will be able to read poems, select favourites and justify preferences.
 |
| **Gathering content** **Grammar:** Warm ups throughout the gathering content phase – focus on suffixes *-ssion* and *-cian.** Select a poem structure e.g. haiku or kenning.
* Use an image or short film clip to inspire writing a haiku or kenning.
* Plot out the poem structure e.g. 5 syllables, 7 syllables, 5 syllables for a haiku.
* Support the children in beginning to experiment with words and phrases, selecting carefully and counting syllables e.g. *water spinning = four.*
 | **Learning outcomes*** Children will be able to prepare a poem for performance.
* Children will be able to generate ideas and vocabulary in preparation for writing a poem.
 |
|  **Writing** * Model writing a haiku or kenning using the collected vocabulary linked to the water theme.
* Children write their own poem following the modelling.
* Following writing, model returning to the class poem to review and evaluate the vocabulary choices. Take feedback from children to highlight effective parts and suggest improvements. Place the advice on a sticky note
 | **Learning outcomes*** Children will be able to identify effective use of intonation, tone and volume when presenting a poem.
* Children will be able to provide constructive
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| **English** |
| **Poems with a Structure – Creative Learning Opportunities and Outcomes (contd.)** |
| next to your poem to consider before editing.* Children review their own poems and those written by others. Highlight effective parts and make suggestions for improvement in vocabulary choices, writing advice on sticky notes.
* Use the suggestions provided to consider improvements and edit before finalising.
 | feedback to others. * Children will be able to perform poems using intonation, tone and volume.
* Children will be able to create poems based on a structure.
* Children will be able to make improvements in the light of evaluation.
 |
| **Outcome** * Poems with a structure e.g. *haiku or kenning.*
 |
| **Presentation** * Children present poems to an audience.
* Publish a class book or display poems linked to artwork.
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| **English** |
| **Information Texts – Creative Learning Opportunities and Outcomes** |
| **Creating interest*** Introduce a bag of items which have been collected from a tourist location linked to water such as The Lake District; River Nile; local nature reserve; water sports activity centre; Loch Ness etc. The Canal and River Trust website ([here](https://canalrivertrust.org.uk/)) will have local suggestions. The items could include leaflets, posters, web pages, souvenirs, maps and diary entries written after visiting the place.Ask the children to explore different items in groups and summarise what they know about this place.
* Prepare a short group presentation to deliver to other group(s) or the whole class.
* Pose key questions such as:
* Would you like to visit this place?
* Why/why not?
* Capture responses through a short writing task.
 | **Learning outcomes** * Children will be able to examine and explain from the information provided.
 |
| **Reading** **Grammar:** Warm ups throughout the reading phase – focus on commas to mark clauses in complex sentences.**Reading and responding** * Through shared reading, explore an information text linked to the theme of water, such as ‘Mousehole’ on the Visit Cornwall website ([here](https://www.visitcornwall.com/places/mousehole#.VQdSAtKsVu5)) or ‘Places to Visit’ on the Canal and River Trust website ([here](https://canalrivertrust.org.uk/places-to-visit?location=chorley&range=0&submit=Search#anch:resultshttps://canalrivertrust.org.uk/places-to-visit?location=chorley&range=0&submit=Search)).
* Model identifying vocabulary which is unfamiliar by playing ‘word pull’. Pull out a word by pretending to grab it and write on a strip of card. Model using a dictionary to look up the word, discuss and model writing your understanding on the strip of card. Take the understanding back to the text to discuss in context. Children follow the modelling with appropriate differentiated texts and dictionaries to explore new vocabulary.
* Using further sections of an information text, model using key questions which involve scanning for dates, names and numbers.
* Provide each group with differentiated key questions to answer orally and in writing which involve scanning for dates, names and numbers.
* Through shared reading, explore a welcome brochure (in hard copy and on a website), for places such as a hotel, a guest house, a holiday village or a town/city, e.g.
* Center Parcs website ([here](http://www.centerparcs.co.uk/villages/index.jsp)).
* Visit Loch Ness website ([here](http://www.visitlochness.com/)).
* Canal and River Trust website ([here](https://canalrivertrust.org.uk/places-to-visit?location=chorley&range=0&submit=Search#anch:resultshttps://canalrivertrust.org.uk/places-to-visit?location=chorley&range=0&submit=Search)).
* Each group reads a different section or page e.g. *introduction/welcome; where are we; what to do; information about the place; facts you find fascinating.*
* After modelling, each child writes an idea or fact from their section on a sentence strip. Play ‘quiz and trade’. This
 | **Learning outcomes** * Children will be able to create complex sentences using commas to mark clauses.
* Children will be able to read an information text.
* Children will be able to use a dictionary to look up new vocabulary and explain in the context of a text.
* Children will be able to scan for dates, names and numbers to answer key questions.
* Children will be able to identify information typically found within sections of text.
* Children will be able to suggest a range of titles for a text.
* Children will be able to identify the different sections of a range of information texts.
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| **English** |
| **Information Texts – Creative Learning Opportunities and Outcomes (contd.)** |
| involves the children in moving around the classroom to find a partner. They then read the sentence strip and their partner decides which section of the text it has come from. They then swap sentence strips. This is repeated three or four times with children meeting different partners. * Model reading a section without a heading selected from a welcome brochure. Read it sentence by sentence, using close reading. Model creating a title for the text before children read a range of welcome brochure sections, deciding on a title. Swap texts with others in the group to add further suggestions for titles e.g. ‘Introduction’ could become ‘Welcome to Loch Ness’ or ‘Loch Ness Welcomes You!’
* Explore a range of information texts, via film and websites, which provide information about a place e.g. *non-chronological reports, fact files, documentary, travel brochures, adverts.* Children write titles for each section read.

**Reading and analysing** * Explain that the focus of the unit is to create an information booklet about a subject or place, such as a welcome brochure for Mousehole.
* Involve the children in analysis of the structure of the whole text e.g. *information about the location, fact file, information about what to do there, history of the place etc.*

|  |  |
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| **Welcome to …****(where the place is located)** |  |
| **History of the place**  |  |
| **Map / diagram / image****(with supporting notes)** |  |
| **What there is to do** |   |
| **Places to eat** |  |
| **Other helpful information** |  |
| **Contact information / telephone numbers etc.**  |  |

* Model identifying the key ideas and the language used in different sections of the text.
* Children follow the modelling to box-up (draw rectangles or ‘boxes’ around sections of the text and label these) differentiated texts.
* Compare the range of structures from the boxed up texts and display these on the working wall.
 |  |
| **Gathering content** **Grammar:** Warm ups throughout the gathering content phase – focus onusing commas to mark clauses in complex sentences. | **Learning outcomes*** Children will be able to create complex sentences using commas to mark clauses.
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| **English** |
| **Information Texts – Creative Learning Opportunities and Outcomes (contd.)** |
| * Decide on a focus for developing a welcome brochure or television presentation e.g. *linked to learning experiences in geography; The Mousehole Cat by Antonia Barber (focus from Story as a Theme unit); Loch Ness (focus from the class novel – The Water Horse by Dick King-Smith); or a local tourist place.*
* Explain that they will be presenting information, as a whole class, which will be:
* recorded for a new programme on television.
* presented as a free welcome brochure to accompany the programme.
* From the reading and analysis phase, use the boxed up plan to structure research and development of ideas e.g.

|  |  |
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| **Welcome to …****(where the place is located)** |  |
| **History of the place**  |  |
| **Map / diagram / image****(with supporting notes)** |  |
| **What there is to do** | 1.2.3. |
| **Places to eat** |  |
| **Other helpful information** |  |
| **Contact information / telephone numbers etc.**  |  |

* Organise the class into small groups with each group having responsibility for one section of the welcome programme or brochure. Alternatively, each group could develop notes for their own programme or brochure.
* Use websites, electronic texts, film clips and other sources to research ideas and information. Model placing notes into a planner.
* Where information is not available, develop own ideas linking to what is already known e.g. *places to eat linked to The Mousehole Cat: Check out The Cat’s Eatery serving Famous Fish Stew, Wild Water and Ale Pie, and Mousehole’s best seller, Hake and Bake Pudding!*
 | * Children will be able to research ideas from a range of sources.
* Children will be able to allocate information found into specific sections of an information text planner.
* Children will be able to develop their own ideas and place notes on a planner.
 |
|  **Writing** * Use shared writing techniques to model a paragraph or section at a time referring to each section of the plan. Focus on skills – using commas to mark clauses in complex sentences.
* Provide a bank of paragraph and sentence openings and frames to which children may refer.
* Use AFL, marking and feedback to adjust shared writing focus daily.
* Model proofreading to check and improve spelling, grammar and punctuation.
 | **Learning outcomes*** Children will be able to write an information text based on a plan using:
* commas in complex sentences.
* paragraphs/sections with key ideas.
* text type features for information texts.
 |
| **English** |
| **Information Texts – Creative Learning Opportunities and Outcomes (contd.)** |
| **Outcome** * Information booklet – welcome brochure.
* Television information programme.
 |
| **Presentation** * Present as a television programme and record using ICT.
* Publish writing in a booklet.
 |