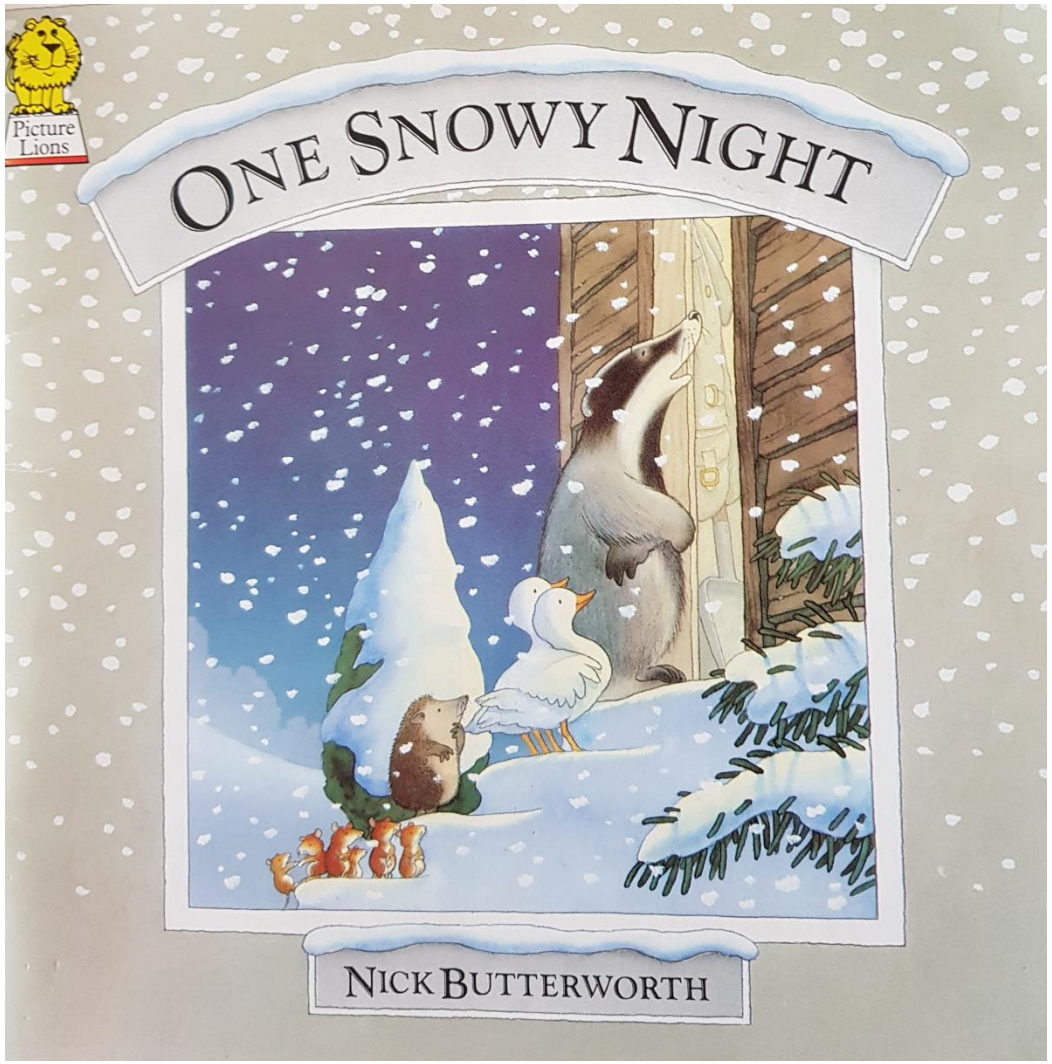
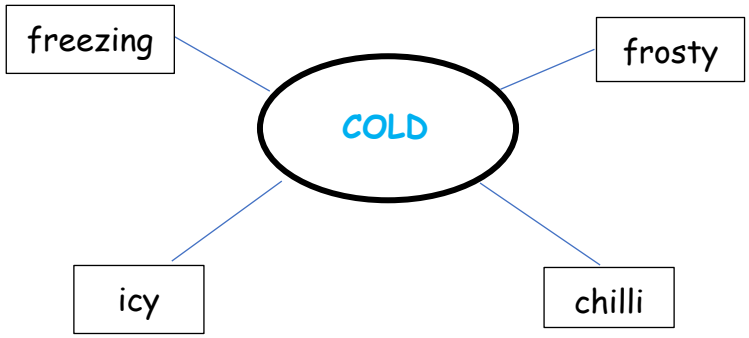
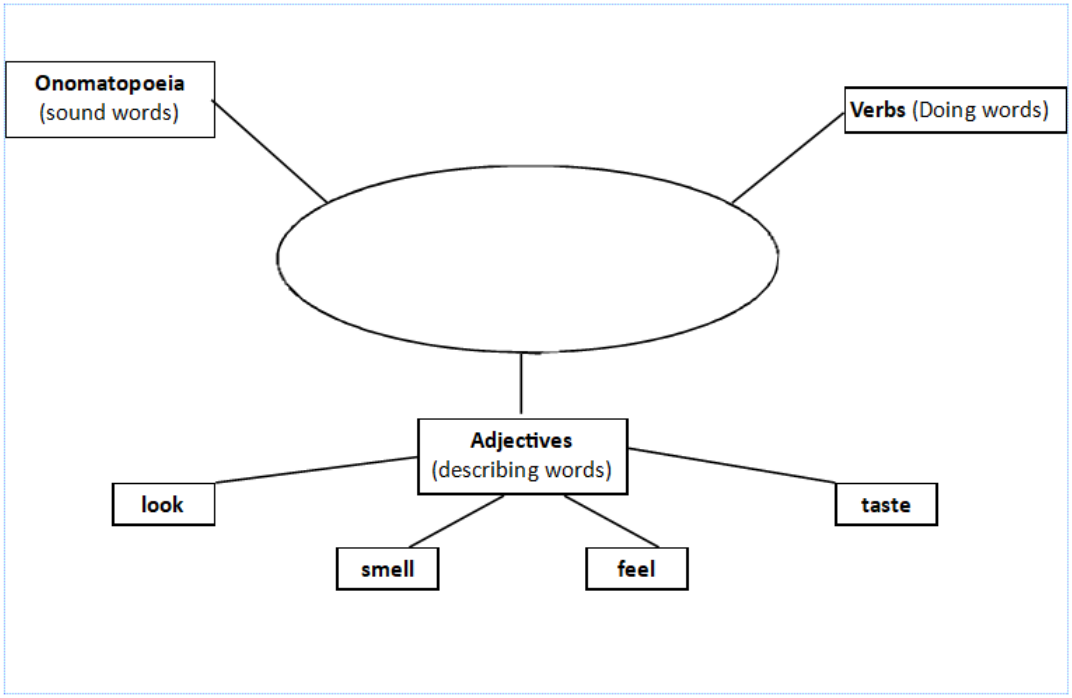
One Snowy Night – Nick Butterworth *(Picture Lions Edition of the book 1991)*



One Snowy Night – Nick Butterworth *(Picture Lions Edition of the book 1991)*

Curricular area	Suggested Learning Activities STEM learning activities are highlighted in yellow	CfE Experiences and Outcomes
Literacy	Introduce adjectives Children can learn about adjectives, create their own then note down adjectives they find throughout their reading of the story	Literacy - Writing By considering the type of text I am creating, I can select ideas and relevant information, organise these in a logical sequence and use words which will be interesting and/or useful for others. LIT 1-26a
Literacy	Children think of alternative and interesting words instead of the word 'cold' e.g. 	Literacy - Writing By considering the type of text I am creating, I can select ideas and relevant information, organise these in a logical sequence and use words which will be interesting and/or useful for others. LIT 1-26a

	Extension/more challenging: (activity from Word Web | Teaching Resources (tes.com)  	
Science Page 2	Percy's hut is cosy and warm. When he goes out and about in the park on a cold day, he puts on his warm coat. Insulation! Investigate to find out which material is best for making a warm coat for keeping Percy nice and warm.	Materials: Properties and uses of substances Through exploring properties and sources of

	Insulation Experiment: Keep Your Body Warm | Science project | Education.com Keeping warm investigation | STEAM Activities | Encounter Edu Resources: several small jars or beakers, warm water, different materials to wrap around the jars or beakers e.g., tinfoil, bubble wrap, towel, fleece, kitchen roll, cotton wool, paper, cling film, cotton fabric, wool fabric etc. elastic bands, and thermometers. *Note: This can also be done using ice cubes to see which material prevents the ice cube melting. (i.e., the slowest rate of melt due to the best insulator). It also links nicely to the 'Snowman' Concept Cartoon (Keogh & Naylor 2000)* *This avoids having to use warm water and thermometers as the amount of water generated by the ice cubes whilst melting can be measured.*  *However, using ice cubes might mean that the link to the story about Percy's coat keeping him warm isn't clear even though the investigation is still about materials and insulation.*	materials, I can choose appropriate materials to solve practical challenges. SCN 1-15a

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Numeracy and Mathematics Page 6	*'One winter's night it was so cold it began to snow. Great big snowflakes fell past the window of Percy's hut.'* A snowflake is a clump of tiny ice crystals. It begins to form when a very cold-water droplet freezes onto a small pollen or dust particle in the sky. This makes one ice crystal. As the snowflake falls, other tiny droplets of water freeze onto the main crystal, building new crystals. The ice crystals in snowflakes form a shape with 6 lines of symmetry. Symmetry is when two parts of a whole are identical. Something is symmetrical if you can draw a line down it and each side looks the same. This is called the Line of Symmetry. Make some snowflakes with 6 lines of symmetry! What makes a shape symmetrical? - BBC Bitesize Making Maths: Snowflakes Snowflake Generator (transum.org) Watch snowflakes form in time lapse through a microscope | The Kid Should See This	Angle, symmetry, and transformation I have explored symmetry in my own and the wider environment and can create and recognise symmetrical pictures, patterns and shapes. MTH 1-19a
Literacy Page 6	Percy makes himself some hot cocoa. Create a set of instructions for Percy for making a cup of hot cocoa. 	Literacy - Writing I can convey information, describe events or processes, share my opinions or persuade my reader in different ways. LIT 1-28a / LIT 1-29a

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Science Page 8	The squirrel tells Percy that his bed is full of snow. Imagine the snow has now turned to ice and the squirrel is trapped inside a block of ice! Devise an investigation to release him (i.e., a Lego figure or similar) from the block of ice! How can you melt the ice quickly to free the figure? Can you do it slowly, so it takes a lot longer? LEGO Activities - LEGO Ice Excavation - Simple Science for Kids (science-sparks.com)	Science - Planet Earth: Processes of the planet By investigating how water can change from one form to another, I can relate my findings to everyday experiences. SCN 0-05a / SCN 1-05a
Science Page 10	'It's fr-reezing,' said one rabbit 'We're f-frozen,' said the other. Investigate and find out if warm water freezes faster than cold water! KS1 Science: Changing States - Solids, Liquids & Gasses - YouTube Changing water- States of matter - YouTube Water: Lesson resources - BBC Teach	Science - Planet Earth: Processes of the planet By investigating how water can change from one form to another, I can relate my findings to everyday experiences. SCN 0-05a / SCN 1-05a
Science Page 13	Percy tells the fox he can come in if he promises to behave. Why did Percy ask the fox to promise to behave? The food chain - BBC Teach	Science - Planet Earth: Biodiversity and interdependence I can explore examples of food chains and show an

		appreciation of how animals and plants depend on each other for food. SCN 1-02a
Numeracy and Mathematics Page 15 (image)	Using ordinal numbers, describe the order of the animals on the steps e.g., ' The hedgehog is third in the line'.	Number and number processes I have explored numbers, understanding that they represent quantities, and I can use them to count, create sequences and describe order. MNU 0-02a
Technology **Engineering challenge!** **Page 16**	Can you design a bed sturdy enough for all the animals to snuggle in with Percy to keep warm? (Please see pages 10 - 19)	Technology – Craft, Design, Engineering, and graphics: Design and constructing models/product

		I can design and construct models and explain my solutions. TCH 1-09a Exploring uses of Materials: I can explore and experiment with sketching, manually or digitally, to represent ideas in different learning contexts. TCH 1-11a Application of Engineering: I explore and discover engineering disciplines and can create solutions. TCH 1-12a
Science Page 17	'What's that noise?' the mouse squeaked Why could the animals all hear the noise that was coming from underneath the floor? How does sound travel? - BBC Teach What is Sound? | Science Experiments for Kindergarten | Kids Academy - YouTube	Science – Forces, electricity, and waves: Vibrations and waves By collaborating in experiments on different ways of producing sound from vibrations, I can

	Investigate sound as vibration by making or watching a slow-motion video of a loudspeaker or tuning fork or by placing rice on the surface of a drum and striking it. Experiment with sound waves – sound waves travel through solid objects as well as air! (That is why the animals could hear the noises from underneath the floor!) 7 Cool Sound Science Experiments for Kids | Article (kidsacademy.mobi): make a paper cup and string phone to show how sound waves can travel through a string.; make a straw pan flute or stick harmonica to investigate how length can affect the pitch of sound waves; listen to sound travelling through water; make xylophone water jars to investigate how different levels of water in a jar changes the pitch of the sound created. 4 Sound Science Experiments for Kids - YouTube	demonstrate how to change the pitch of the sound. SCN 1-11a
Literacy Page 23 (Image)	Prepositions of place: Introduce prepositions and prepositional phrases of place. Use the picture on page 23 to practise forming sentences using prepositions and prepositional phrases of place: e.g. The badger is under the blanket The fox is on top of the cupboard The duck is inside the hat The duck is under the leaves	Literacy – Writing By considering the type of text I am creating, I can select ideas and relevant information, organise these in a logical sequence and use words which will be interesting and/or useful for others. LIT 1-26a

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Literacy	Make a list of all the animals that knock at Percy's door. Find out about/research the animals and create a fact file.	Literacy - Reading Using what I know about the features of different types of texts, I can find, select, sort and use information for a specific purpose. LIT 1-14a

The Engineering Challenge!

Engineering is part of the Curriculum for Excellence, but available information is limited; it is specifically mentioned in outcomes **TCH 0-12a/1-12a/2-12a.** However, opportunities for engineering can be found in other areas of the curriculum, especially if consideration is given to different engineering disciplines e.g., Civil Engineering, (Social Subjects, Science, Maths, Expressive Arts) Mechanical Engineering (Technology. Science, Maths Expressive Arts) etc.

The engineering challenge suggested in this resource pack is an ideal opportunity to use the ***Engineering Habits of Mind*** and the ***Engineering Design Process***, both which support and enable the delivery of high-quality learning experiences of engineering education.

Engineering Habits of Mind have been developed by the Centre for Real World Learning and the Royal Academy of Engineering and identifies six engineering habits of mind which describe the ways engineers think and act: systems-thinking, adapting, problem finding, creative problem-solving, visualising, and improving.

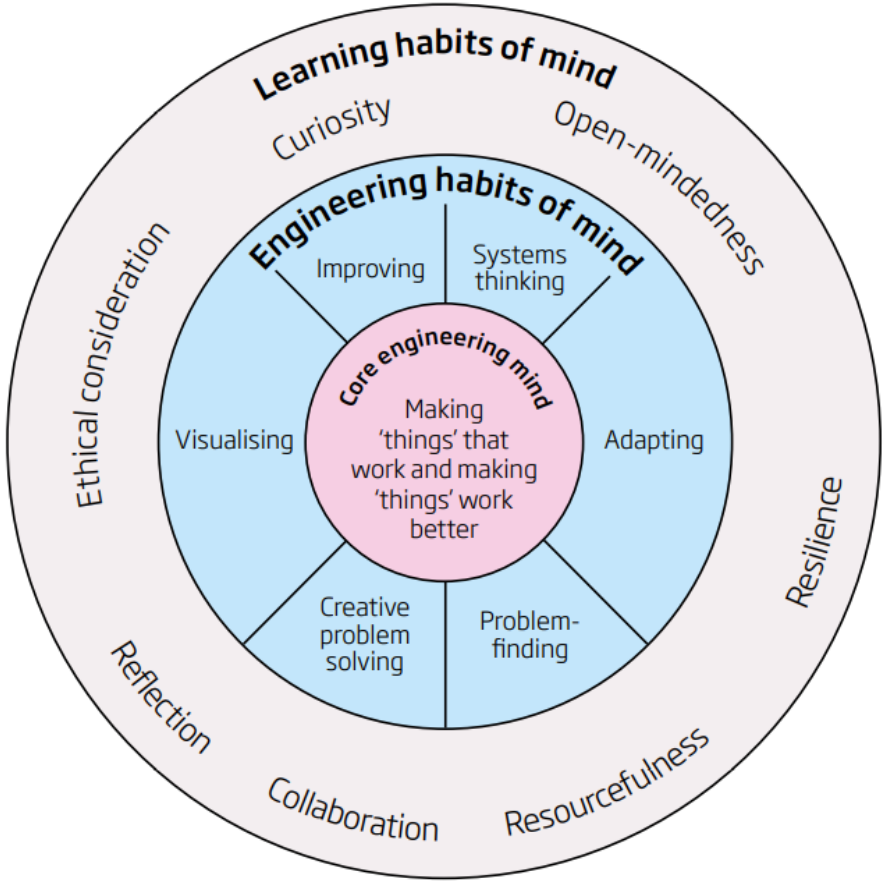
Further information about these can be found here:

Bill Lucas Webinar: Engineering Habits of Mind

https://www.youtube.com/watch?v=1Ty3MIDPZ3s

One Snowy Night – Nick Butterworth *(Picture Lions Edition of the book 1991)*

Engineering Habits of Mind



- **Systems Thinking – Smaller parts coming together to make a whole.**
- **Problem Finding – Finding problems, deciding how to fix them and checking existing solutions.**
- **Visualising – Thinking about how the final product will look.**
- **Creative Problem Solving – Working together to create solutions to problems.**
- **Improving – Making things better.**
- **Adapting – Applying things in a new context.**

Further information about each of these and how are broken down into the skills/the approaches involved is provided on the next page

One Snowy Night – Nick Butterworth *(Picture Lions Edition of the book 1991)*

Systems thinking	Problem-finding	Visualising
Using ideas from one subject in another subject	Asking lots of questions to make sure I understand	Thinking out loud when I am being imaginative
Working out the possible consequences of something, before they happen	Finding out why something doesn't work	Making a plan before I start work
Putting things together to make something new	Checking and checking again until I'm happy	Practising something in my head before doing it for real
Spotting similarities and difference between things	Finding mistakes in mine and other people's work	Making models to show my ideas
Spotting patterns and working out what comes next	Thinking about the world around me, and how it could be better	Explaining my ideas to other people so that they understand

Creative problem solving	Improving	Adapting
Coming up with lots of good and new ideas	Working hard and practising to get better, even when it's tricky	Explaining how well I am doing to my teacher or friends
Making really detailed mind-maps	Working out what I need to do to improve	Evaluating how good something is
Thinking before doing something	Making what I've done better	Sticking up for what I think when talking with other people
Working succesfully in a group	Experimenting with things, just to see what happens	Deciding how something could be done differently
Taking on board other people's ideas and using them	Sticking at doing something until it's the best it can be	Behaving appropriately in different settings

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One Snowy Night – Nick Butterworth *(Picture Lions Edition of the book 1991)*

How can we develop pupils' ***Engineering Habits of Mind***? … by using the ***Engineering Design process!***

The Engineering Design Process

ASK: Students identify the problem, requirements that must be met, and constraints that must be considered.

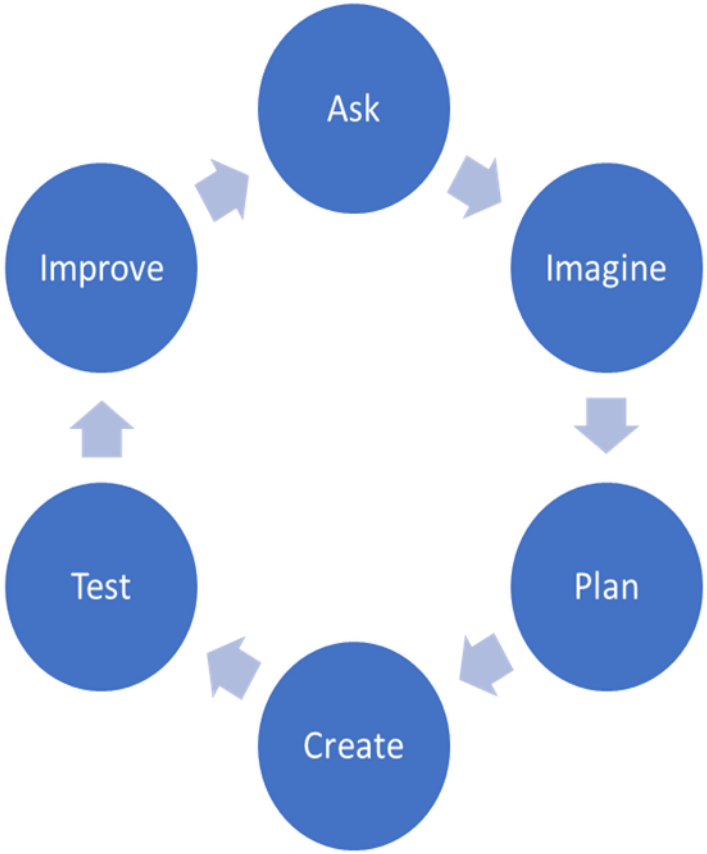
IMAGINE: Students brainstorm solutions and research ideas. They also identify what others have done.

PLAN: Students choose two to three of the best ideas from their brainstormed list and sketch possible designs, ultimately choosing a single design to prototype.

CREATE: Students build a working model, or prototype, that aligns with design requirements and that is within design constraints.

TEST: Students evaluate the solution through testing; they collect and analyse data; they summarise strengths and weaknesses of their design that were revealed during testing.

IMPROVE: Based on the results of their tests, students make improvements on their design. They also identify changes they will make and justify their revisions.



NB: THIS PROCESS IS A CYCLE – NOT LINEAR

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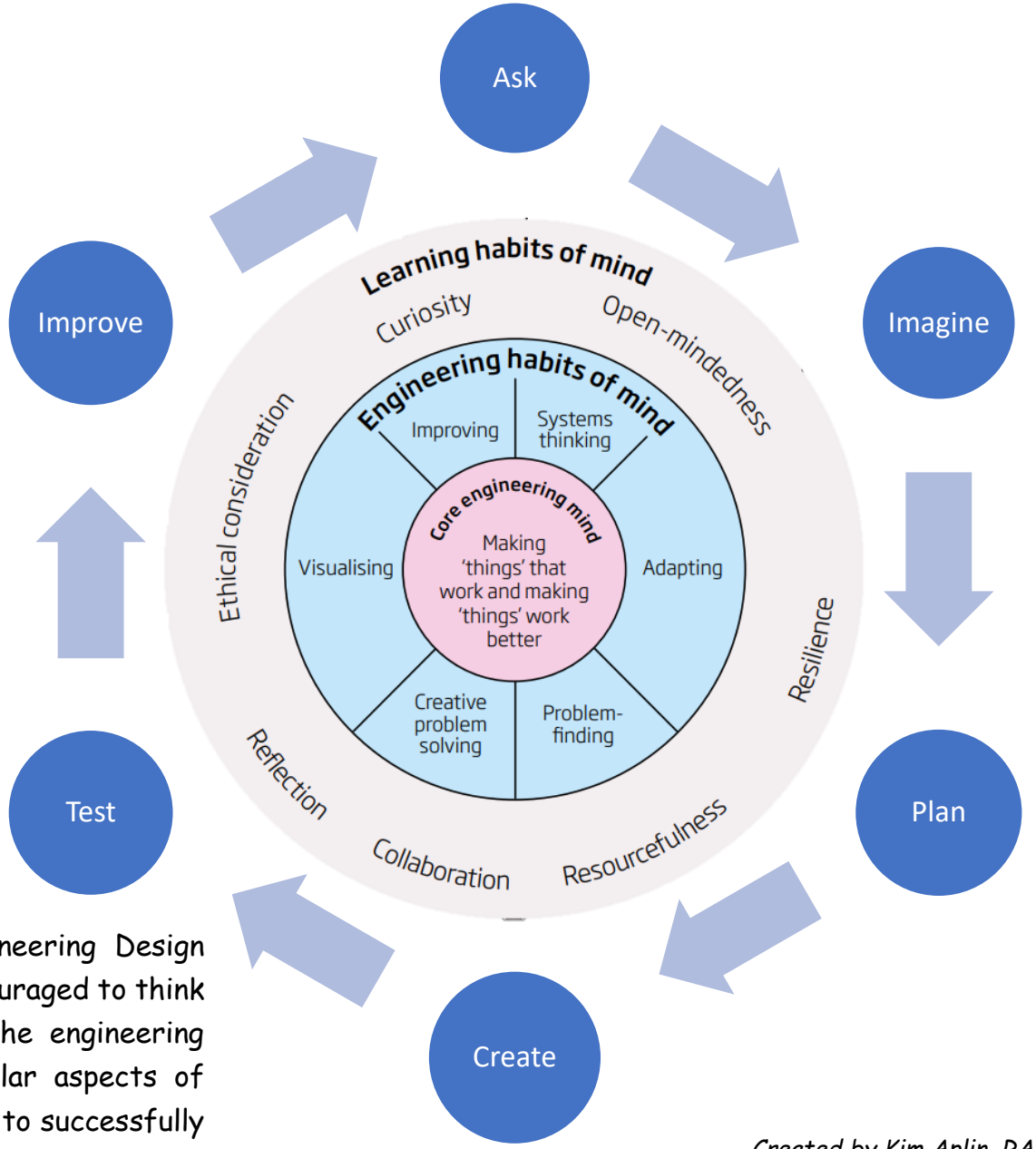

Whilst working through the Engineering Design process cycle, pupils should be encouraged to think about and to identify which of the engineering habits of mind and which particular aspects of them they are using or need to use to successfully tackle each part of the cycle/process.

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	Systems thinking		Creative problem solving
	Problem-finding		Improving
	Visualising		Adapting

The Engineering Challenge!

Engineering Habits of Mind

ASK: identify the problem, requirements that must be met, and constraints that must be considered

All the animals want to snuggle into bed with Percy to keep warm!

Can you design a bed sturdy enough for all the animals to snuggle in with Percy to keep warm?

Constraints:

- The bed must be strong enough to hold a weight of 2kg
- The bed must stand on its own
- It must be constructed using the materials provided

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One Snowy Night – Nick Butterworth *(Picture Lions Edition of the book 1991)*

IMAGINE: brainstorm solutions and research ideas. They also identify what others have done through research.

Questions might include: *How will you build the bed? What does the bed need to include? What will you do to make it stable?*

Children should brainstorm and come up with a number of ideas.

PLAN: choose two to three of the best ideas from their brainstormed list and sketch possible designs, ultimately choosing a single design to prototype.

This part of the design process may involve allowing the children to explore/tinker with the materials that are available to create their designs.

Suggested materials: *newspaper, paper, cardboard, tape, glue, glue gun, scissors, craft sticks, sticks and wood scraps, measuring tape/rulers, crayons, pencils, felt pens, balance scale and weights, a 2 kg weight, 'makedo' kit*

Children should draw/sketch their ideas, taking into account the materials that are available for them to use.

Questions might include: *What part of the bed do the animals lie on? What parts keep them off the floor? How will you make the bed strong enough so that the animals can all sleep on it?*

CREATE: build a working model, or prototype, that aligns with design requirements and that is within design constraints.

Use the materials to build/construct the bed. It must be strong and sturdy and stand up on its own.

One Snowy Night – Nick Butterworth *(Picture Lions Edition of the book 1991)*

TEST: evaluate the solution through testing; collect and analyse data; summarise strengths and weaknesses of the design that were revealed during testing. *How can you test it? What is the maximum weight your bed can hold? Can your bed hold all of the animals at once (2kgs)?*			
IMPROVE: based on the results of their tests, children make improvements to their design. They also identify changes they will make and justify their revisions. *Does it work? What could be changed to make it more stable/stronger? Does it hold at least 2kgs?* **It is important that time is given for the improvements to be made and for the models to be retested.**			
SHARE: the children show their project to other people and tell them how they made it. Ask them if they have any ideas to make it better/improve it. *Test several beds to find out which designs hold the most weight/are the strongest. Discuss/think about what is it that is included in the design that makes the bed strong.*			

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Possible specific 'Engineering Habits of Mind' for this challenge:

IMAGINE	Systems thinking	Using ideas from one subject in another subject
	Problem-finding	Asking lots of questions to make sure I understand
PLAN	Systems thinking	Using ideas from one subject in another subject Putting things together to make something new (tinkering)
	Visualising	Thinking out loud when I am being imaginative Making a plan before I start work Practising something in my head before doing it for real Explaining my ideas to other people so that they understand
	Creative problem solving	Coming up with lots of good and new ideas Making detailed mind-maps Working successfully in a group Taking on board other people's ideas
CREATE	Systems thinking	Using ideas from one subject in another subject Putting things together to make something new
	Visualising	Making models to show my ideas Explaining my ideas to other people so that they understand
	Creative problem solving	Thinking before doing something Working successfully in a group Taking on board other people's ideas
TEST	Problem-finding	Finding out why something doesn't work Checking and checking again until I am happy Finding mistakes in mine and other people's work

One Snowy Night – Nick Butterworth *(Picture Lions Edition of the book 1991)*

	Improving	Working out what I need to do to improve Making what I have done better Experimenting with things, just to see what happens Sticking at doing something until it's the best it can be
	Adapting	Evaluating how good something is Deciding how something could be done differently
IMPROVE	Problem-finding	Checking and checking again until I am happy Finding mistakes in mine and other people's work
	Improving	Working out what I need to do to improve Making what I have done better Sticking at doing something until it's the best it can be
	Adapting	Evaluating how good something is Sticking up for what I think when talking with other people Deciding how something could be done differently
SHARE	Problem-finding	Asking lots of questions to make sure I understand Finding mistakes in mine and other people's work
	Improving	Working out what I need to do to improve Making what I have done better
	Adapting	Evaluating how good something is Deciding how something could be done differently