

**Key Concepts: cultural understanding, innovation, design, construction, critical evaluation**

KEY:	Structures	Mechanisms	Textiles	Cooking and Nutrition	Computer-Controlled Products	Electrical Systems
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Pre-school

	Design 3&4 year olds EAD Develop own ideas and decide which materials to use to express them. PD Choose the right resources to carry out their own plan.	Make 3&4 year olds EAD Join different materials and explore textures. Make imaginative and complex 'small worlds' with blocks and construction kits.. EAD Explore, use and refine a variety of artistic effects to express their ideas and feelings.	Evaluate 3&4 year olds EAD Through discussions, referring to books, wall displays and online resources, build on previous learning, refine ideas and develop their ability to represent them.
	Skills will be developed through the following activities:		
All About Me & Nursery Rhymes	*designing and making lolly stick star wands *creating and working collaboratively to build towers to represent places of importance eg home, places visited using Lego *decorating a biscuit using icing		
Celebrations	*designing our Christmas party placemats and party hats *creating poppy biscuits for Remembrance Day *creating our own firework rockets using toilet rolls *making Christmas decorations using salt dough and choosing decorations *choosing suitable sized sticks to create their own Stick Man		
Traditional Tales	*creating own Gingerbread man - learning about ingredients *using junk modelling to create Hansel and Gretel's house *creating representations of the 3 Little pigs houses using different media - eg straw, sticks and lego bricks		
Journeys	*designing and creating maps leading to treasure *using junk modelling to create treasure chests		
Minibeasts	*using lego/polydron/duplo/mobilo to create enclosures for minibeasts *selecting resources to create A Very Hungry Caterpillar and discussing healthy/unhealthy foods		
People Who Help Us	*creating vehicles used by Emergency Workers using junk modelling *contributing to the design and creation of role play area - doctors/vets etc		

Reception Year

	Design ELGs C&L Speaking Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary;	Make ELGs EAD Creating with Materials Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; UW The Natural World Explore the natural world around them, making observations and drawing pictures of animals and plants; PD Fine Motor Skills Use a range of small tools, including scissors, paint brushes and cutlery;22	Evaluate ELGs EAD Creating with Materials Share their creations, explaining the process they have used;
	Skills will be developed through the following activities:		
Marvellous Me!	*Harvest cookery- baking bread (Harvest Festival Week) *constructing houses with junk modelling/construction toys.		
Once Upon a Time	*Diwali/ Hanukkah cookery *making Castles from cereal boxes and cardboard tubes, lolly sticks. *making Christmas decorations (child-led)		
Space Explorers	*building rockets for space, using large and small construction, inside and outside		
Roots, shoots and muddy boots	*making and eating a variety of healthy foods using fruits and vegetables including vegetable soup, fruit salad, fruit kebabs or fruit smoothies.		
Mad about Animals	* *making a range of animals using junk modelling (child-led) *building animal homes using construction and natural materials (child-led) *making bird feeders		
Pirates, Mermaids and Under the Sea	*designing and constructing a pirate ship using crates, planks, boxes and other large materials and small-scale junk modelling *making treasure chests, telescopes and binoculars (child-led) *making a model boat and test if it floats *making a lighthouse (revisit cardboard attachments, painting repeating patterns)		

Children will:	Design Understanding contexts, users and purposes Developing and communicating ideas	Make Planning Developing practical skills and techniques	Evaluate Evaluating existing products Evaluating their own ideas and products
Topic Come Outside Strand Christmas card with moving parts (levers and sliders) Strand Mechanisms	*explore why people send cards at Christmas and when the tradition started *investigate a range of Christmas card designs – what do they often feature? *investigate a range of books with moving parts *learn how to construct moving parts such as levers and sliders *learn about the characteristics of the materials and components they are using *describe the purpose and intended user of their product – a Christmas card with moving parts *develop a simple design criteria for a Christmas card with moving parts *develop their design ideas through discussion, observation, drawing and modelling *make simple drawings and label parts	*plan by suggesting what to do next *begin to identify which tools and materials they will need; use vocabulary to name and describe them; explain why they have made these selections *cut materials (mostly cardboard) with developing accuracy *learn how to use components such as split pins *assemble, join and combine materials in order to make a Christmas card with moving parts *choose and use appropriate finishing techniques – for example, colouring, collaging, painting...	Start of the unit *evaluate existing products relevant to the units (cards/books with moving parts/a range of children's toys/fruit/fruit dishes), exploring: - what their purpose is - how they work - how and where they are used - what materials are used - what they like and dislike about them During the unit *talk about their design ideas and what they are making, identifying strengths and possible changes they might make End of the unit *evaluate their product against their design criteria, saying what worked well and what could be improved
Topic Let's Play Product Toys from recycled materials Strand Structures	*research different types of toys (actual toys and images of toys made from recycled materials) *learn about the characteristics of the materials to be recycled and the components they are using *explore ways to join materials – different glues, different tapes – which work best for different materials *describe the purpose and intended user of their product – a toy for young children to enjoy which recycles materials that would otherwise be thrown away *develop a simple design criteria for a toy made from recycled materials *develop their design ideas through discussion, observation, drawing and modelling *make simple drawings and label parts	*plan by suggesting what to do next *begin to identify which tools and materials they will need; use vocabulary to name and describe them; explain why they have made these selections *cut and shape materials with developing accuracy *assemble, join and combine materials in order to make their toy *choose and use appropriate finishing techniques – for example, colouring, collaging, painting...	
Topic Living Things Product Salad Strand Cooking and Nutrition	*explore a range of salad vegetables and fruits considering: appearance, taste, texture, colour, where they come from *explore mini-pots of salad available from supermarkets (look at vegetable combinations – but problem of plastic packaging) *describe the purpose and intended user of their product – a tasty and healthy snack with minimal packaging/environmental impact	*write a simple recipe *begin to select utensils/equipment and ingredients they will need; use vocabulary to name and describe them; explain why they have made these selections *learn how to use utensils safely and appropriately to peel and cut *follow safe procedures for food safety and hygiene *choose and use appropriate finishing techniques (eg. arranging components to create a picture)	

	*develop a simple design criteria for a salad *develop their design ideas through discussion, observation, drawing and modelling *make simple drawings and label parts		
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Topic Great Fire of London Product Toy fire engine with axle and wheels Strand Mechanisms	*explore the need for a fire service following the Great Fire of London and the invention of the first fire engines in 1721 – a design need was identified and met *investigate toy cars/trucks – how do the wheels move? *use construction kits (Knex) to explore vehicles with wheels and axles *learn about the characteristics of the materials and components they are using *describe the purpose and intended user their product – a toy fire engine with moving wheels *develop a simple design criteria for a toy fire engine, through examining pictures/diagrams of modern fire engines and toy fire engines *develop their design ideas through discussion, observation, drawing and modelling, using ICT where appropriate *make simple drawings and label parts	*plan by suggesting what to do next *begin to identify which tools and materials they will need; use vocabulary to name and describe them; explain why they have made these selections *measure, cut and score materials (mostly cardboard) with increasing accuracy *learn how to use junior hacksaws safely and appropriately *assemble, join and combine materials in order to make a moving fire engine *choose and use appropriate finishing techniques to customise appearance of fire engine (eg. headlights, number plate, painting and collage materials)	Start of the unit *evaluate existing products relevant to the units (toy fire engines/smoothies/'fabric pictures'), exploring: - what their purpose is - how they work - how and where they are used - what materials are used - what they like and dislike about them During the unit *talk about their design ideas and what they are making, identifying strengths and possible changes they might make End of the unit *evaluate their product against their design criteria, saying what worked well and what could be improved
Topic The World Around Us Product Fruit smoothies using Jamaican fruits Strand Cooking	*explore the range of smoothies available on the market, learning about their roots in cultures around the world and the increase in popularity since the 1990s *investigate the ingredients used in different smoothies *follow recipes to try out a range of smoothies *describe the purpose and intended user of their product – a tasty and healthy smoothie using Caribbean fruits *develop a simple design criteria for a smoothie *develop their design ideas through discussion, observation, drawing and modelling, using ICT where appropriate *make simple drawings and label parts	*write a simple recipe *begin to select utensils/equipment and ingredients they will need; use vocabulary to name and describe them; explain why they have made these selections *learn how to use utensils safely and appropriately to cut, peel and grate *follow safe procedures for food safety and hygiene *choose and use appropriate finishing techniques (eg. using a fruit garnish, choosing a beaker/jug for serving...)	
Topic The World Around Us Product Hand Puppet Strand Textiles	*explore a range of 'fabric pictures', particularly those of flowers/plants, particularly identifying how they have been made *describe the purpose and intended user of their product –an attractive pictorial representation of a flower using textiles *develop a simple design criteria for a fabric picture *develop their design ideas through discussion, observation, drawing and modelling, using ICT where appropriate *make simple drawings and label parts	*plan by suggesting what to do next *begin to select tools and materials; use vocabulary to name and describe them; explain why they have made these selections *learn how to use needles and scissors safely and appropriately *cut, shape and join fabric to make a simple 'picture' *use basic sewing techniques	

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Topic Animals and Humans Product Healthy soup Strand Cooking and Nutrition	*explore a range of soups and recipes, considering their nutritional value and their place within a balanced diet *investigate possible ingredients, considering their nutritional value; whether they have been grown (fruit/veg) or reared (meat); and how combinations of ingredients may complement each other, people's likes and dislikes *describe the purpose of their product - soup which could be part of a healthy, balanced diet *use their research to begin to develop their own design criteria for a healthy soup *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate *make design decisions that take account of the availability of resources *use annotated sketches to develop their ideas, indicating the features that will appeal to intended users and why particular ingredients have been chosen	*plan the order of the main stages of working – write a recipe *select utensils/equipment, techniques and ingredients for making their soup, explaining their choices *learn how to work safely and accurately with a range of utensils *learn about hygienic food preparation and storage *prepare and cook soup *use a range of techniques such as peeling, chopping, slicing, grating and liquidising *use finishing techniques to improve the appearance of their soup	Start of the units *disassemble a range of existing products relevant to the units (soup/bridges), analysing: - how well products have been designed - how well products have been made - why materials have been chosen - what methods of construction have been used - how well products work - how well products achieve their purposes - how well products meet user needs and wants - who designed and made the products - where products were designed and made - when products were designed and made - whether products can be recycled or reused During the units *consider how well their design is meeting their intended purpose by referring to the design criteria and decide whether they need to make any changes
Topic Light and Sound Product Strand Computer-controlled product	*explore a range of computer-controlled products using Lego WeDo: Glow in the dark snail, the Satellite, the Cooling fan, and Milo the rover. *investigate how computer-controlled products work and how different outputs can be achieved: speed, direction of travel, sound and use of motion and tilt sensors *use their research to begin to develop their own design criteria for a computer-controlled Lego model *describe the purpose of their product *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate *make design decisions that take account of the availability of resources *use annotated sketches to develop their ideas, indicating the features that will appeal to intended users and how particular parts work	*plan the order of the main stages of making *select Lego equipment *explain their choices *learn how to construct computer-controlled Lego models, following online instructions *learn how to program computer-controlled Lego models *develop accuracy in assembling components	End of the units *evaluate their product against the original design criteria, identifying how well it meets its intended purpose
Topic Romans Product Bridge	*research different types of bridges (internet pictures), *investigate and compare different structural features of bridges *describe the purpose of their product – a bridge to span a specified length or carry a certain weight	*plan the order of the main stages of making *select tools and materials, using scientific knowledge about the properties of materials to inform their choice *learn about ways to strengthen structures *select techniques for cutting, joining and strengthening	

Strand Structures	*use their research to begin to develop their own design criteria for a bridge *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate *make design decisions that take account of the availability of resources *use annotated sketches to develop their ideas, indicating the features that will appeal to intended users and how particular parts work	*explain their choices *measure, mark out, cut, score and assemble components with more accuracy *learn how to work safely and accurately with a range of simple tools *use finishing techniques to improve the appearance of their product using a range of equipment	
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Topic How to Train a Dragon (English) Product Dragon traps Strand Structures	*explore a range of pulley systems used in everyday products such as blinds, on a flagpole, on a building site and theatre curtains *investigate how pulleys work *describe the purpose of their product – an effective dragon trap using a pulley system * use their research to begin to develop their own design criteria for a dragon trap using a pulley system *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate *make design decisions that take account of the availability of resources *make labelled drawings from different views showing specific features, indicating the features that will appeal to intended users and how particular parts work	*plan the order of the main stages of making *select appropriate tools and techniques for making their product, explaining their choices *select materials, using scientific knowledge about the properties of materials to inform their choice (junk materials) *be taught how to construct a pulley system (pencil, thread spool, plastic cup and wool) to work between 2 tables *measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques *join and combine materials and components accurately in temporary and permanent ways *use finishing techniques to ensure the aesthetic appeal of their product (focus on camouflage finish)	Start of the units *evaluate products relevant to the units (woven products/books with moving parts), analysing: - how well products have been designed - how well products have been made - why materials have been chosen - what methods of construction have been used - how well products work - how well products achieve their purposes - how well products meet user needs and wants - who designed and made the products - where products were designed and made - when products were designed and made - whether products can be recycled or reused *identify criteria that can be used for their own designs During the units *consider how well their design is meeting their intended purpose by referring to the design criteria and decide whether they need to make any changes End of the units *evaluate their product against the original design criteria, carrying out appropriate tests: Dragon trap – does the pulley system work? Books – used by younger children who give feedback, particularly on effectiveness of moving parts
Topic Africa Product Woven Item Strand Textiles	*explore a range of African weaving: baskets, cloth (rugs, clothing etc) and recycled plastic products, particularly woven plastic bags produced by African collective as described in the book: One Plastic Bag *investigate weaving processes *describe the purpose of their product – a woven product, recycling used fabric * use their research to begin to develop their own design criteria for a woven item *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate *make design decisions that take account of the availability of resources *make labelled drawings from different views showing specific features, indicating the features that will appeal to intended users and how particular parts work	*plan the order of the main stages of making *select appropriate tools and techniques for making their product, explaining their choices *select materials, using scientific knowledge about the properties of materials to inform their choice (paper, plastic, fabric) *be taught how to weave and sew effectively *measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques *join and combine materials and components accurately in temporary and permanent ways (weaving, stitching, gluing) *use finishing techniques to ensure the aesthetic appeal of their product (quality of weaving and edging and securing of weaving)	
Topic Habitats Product Habitats book with moving	*explore a range of books with moving parts *read these books with younger children and ask them about their likes/dislikes with regard to the moving parts *investigate different types of mechanisms/moving parts: flaps, pop-ups, levers and linkages to create side-to-side and up-and-down movements	*plan the order of the main stages of making *select appropriate tools and techniques for making their product, explaining their choices *select materials, using scientific knowledge about the properties of materials to inform their choice (card) *be taught how mechanical systems such as levers and linkages create movement	

parts, including levers and linkages Strand Mechanisms	*describe the purpose of their product – a book with levers and linkages *use their research to begin to develop their own design criteria for a book with levers and linkages *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate *make design decisions that take account of the availability of resources *make labelled drawings from different views showing specific features, indicating the features that will appeal to intended users and how particular parts work	*measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques *join and combine materials and components accurately in temporary and permanent ways *use finishing techniques to ensure the aesthetic appeal of their books (quality of cutting, sticking, colouring and collaging)	
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Topic States of Matter Product Pizza Strand Cooking	*explore pizza recipes and examples of pizzas (different types of bases and toppings); where and when they originate from *generate innovative ideas through discussion and identify a purpose for their dish *investigate potential ingredients, considering their nutritional value; whether they are grown (grains/pulses/fruit/veg), reared (meat/poultry) or caught (fish); and where they are produced (the UK, Europe or the wider world) *investigate how seasons may affect the food available and how food is processed into ingredients that can be eaten or used in cooking * consider how to adapt a recipe to change the appearance, taste, texture or aroma * carry out research, using surveys, interviews, questionnaires and web-based resources * identify the needs, wants, preferences and values of particular individuals and groups that their dish will be cooked for *use their research to write their own design criteria for a pizza with healthy toppings *make labelled drawings, including exploded and cross-sectional diagrams, indicating the features that will appeal to intended users and how particular parts work (Bake Off examples) *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate • make design decisions, taking account of constraints such as time, resources and cost	*develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail (write a recipe) *select appropriate utensils/equipment and techniques, including kneading and proving dough, explaining choices *select ingredients, using scientific knowledge about the properties of materials to inform their choice *use skills in using different tools and equipment safely and accurately *weigh and measure accurately (time, dry ingredients, liquids) *apply the rules for basic food hygiene and other safe practices e.g. hazards relating to the use of ovens *use finishing techniques such as glazing the crust, serving with garnishes	Start of the units *evaluate products relevant to the units (pizzas, electrical games), analysing: - how well products have been designed - how well products have been made - why materials have been chosen - what methods of construction have been used - how well products work - how well products achieve their purposes - how well products meet user needs and wants - who designed and made the products - where products were designed and made - when products were designed and made - whether products can be recycled or reused - how much products cost to make - how innovative products are -how sustainable the materials in products are -what impact products have beyond their intended purpose *identify criteria that can be used for their own designs During the units *critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make End of the units *evaluate their products against the original design specification, carrying out appropriate tests Pizza – taste product and evaluate taste, texture, appearance Computer-controlled product– does it achieve what they intended?
Topic Electricity Product Electrical game Strand Electrical systems	*explore electrical games, eg, 'Operation', investigating how they work *interview peers about what makes a good board/electrical game (market research) *generate innovative ideas through discussion and identify a purpose for their product – an electrical game which.... *apply scientific learning about electrical circuits and components	*develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail *select appropriate tools and techniques, explaining choices *select materials, using scientific knowledge about the properties of materials to inform their choice *use skills in using different tools and equipment safely and accurately	Electrical game – play games with peers, gather feedback

	*use their research to write their own design criteria for an electrical game *make labelled drawings, including exploded and cross-sectional diagrams, indicating the features that will appeal to intended users and how particular parts work *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate • make design decisions, taking account of constraints such as time, resources and cost	*measure and mark out accurately *cut and join with accuracy to ensure a good-quality finish to the game	
Topic Lifecycles Product Strand Computer-controlled product	*explore a range of computer-controlled products used in real-life contexts, for example: automatic gates, the Mars Rover, Alexa, use of Hive app on the phone to control heating etc (film) *investigate how computer-controlled products work and how different outputs can be achieved using Lego WeDo: 'Glow bug', 'Satellite', 'Windmill' and 'Spy-Bot.' (revision) *explore the use of robots, their use in society and their capacity to solve problems *investigate how to build a robot to solve a specific problem using Lego WeDo (Guided Projects- Science section - 'Pulling' and 'Robust Structures.' * generate innovative ideas through discussion and identify a purpose for their product * use their research to begin to write their own design criteria for a Lego WeDo robot that can solve a problem of their choice *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate *make design decisions that take account of the availability of resources *make labelled drawings, including exploded and cross-sectional diagrams, indicating the features that will appeal to intended users and how particular parts work	*develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail *select appropriate tools and techniques (within Lego WeDo resources), explaining choices *learn how to construct computer-controlled Lego models, following online instructions *learn how to program computer-controlled Lego models *develop accuracy in assembling components safely and accurately	

Children will:	Design Understanding contexts, users and purposes Developing and communicating ideas	Make Planning Developing practical skills and techniques	Evaluate Evaluating existing products Evaluating their own ideas and products
Topic Earth, Sun and Moon Product Solar system mobile Strand Structures	*explore a range of mobiles, investigating how they have been constructed *interview Y4 children about knowledge of the solar system and how a 3D representation might help them to learn (market research) *generate innovative ideas and identify a purpose for their product – an educational solar system model *use their research to write their own design criteria for a solar system mobile/model *make labelled drawings, including exploded and cross-sectional diagrams, indicating the features that will appeal to intended users and how particular parts work *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate • make design decisions, taking account of constraints such as time, resources and cost	*develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail *select appropriate tools (saws, glue guns, drills), and techniques, explaining choices *select materials, using scientific knowledge about the properties of materials to inform their choice *use different tools and equipment safely and accurately *measure and mark out accurately *make modifications, where necessary *cut and join with accuracy to ensure a good-quality finish to the model	Start of the units *evaluate products relevant to the units (mobile, _____, ugly dolls), analysing: - how well products have been designed - how well products have been made - why materials have been chosen - what methods of construction have been used - how well products work - how well products achieve their purposes - how well products meet user needs and wants - who designed and made the products - where products were designed and made - when products were designed and made - whether products can be recycled or reused - how much products cost to make - how innovative products are - how sustainable the materials in products are - what impact products have beyond their intended purpose
Topic Forces Product Cams Strand Mechanisms	*explore and learn about how cams create movement *identify a purpose for their product and generate innovative ideas – a moving toy for a target audience of their choice *use their research to write their own design criteria for a moving toy *make labelled drawings, including exploded and cross-sectional diagrams, indicating the features that will appeal to intended users and how particular parts work *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate *make design decisions, taking account of constraints such as time, resources and cost	*develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail *select appropriate tools (saws, glue guns), and techniques, explaining choices *select materials, using scientific knowledge about the properties of materials to inform their choice *use different tools and equipment safely and accurately *measure and mark out accurately *make modifications, where necessary *cut and join with accuracy to ensure a good-quality finish to the model	*identify criteria that can be used for their own designs During the units *critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make End of the units *evaluate their products against the original design specification, carrying out appropriate tests *record evaluations with labelled diagrams Mobiles – share with Y4 pupils, gather feedback – Ugly dolls – share with peers, gather feedback
Topic Adaptation, evolution and classification Product Ugly dolls Strand	*investigate Ugly Dolls: how and why they were designed and made, the variety of designs available *conduct research, including surveys of other pupils, to discover the popularity of different colours/designs/sizes etc of Ugly Dolls *generate innovative ideas and identify a purpose for their product – a well-made Ugly Doll which reflects current trends	*develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail *be taught how to use a pattern *be taught a variety of stitches *select appropriate tools, and techniques (types of stitches), explaining choices	

Textiles	*use their research to write their own design criteria for an UglyDoll *make labelled drawings, including exploded and cross-sectional diagrams, indicating the features that will appeal to intended users and how particular parts work *through discussion, explore, develop and communicate design proposals by modelling ideas, using ICT where appropriate • make design decisions, taking account of constraints such as time, resources and cost	*use equipment safely and accurately *measure and mark out accurately *make modifications, where necessary *cut and join with accuracy to ensure a good-quality finish to the toy	
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