



DESIGN & TECHNOLOGY

Common Misconceptions

Responsive Teaching | EYFS to Year 6 | Park Road Units

Purpose of this document

This document identifies common misconceptions that may limit pupils' progress in Design and Technology and suggests concise, practical responses. It is organised around Park Road Academy's selected units and supports teachers in checking prior knowledge, modelling technical concepts and addressing misunderstandings through product analysis, demonstration, comparison, testing and iteration.

Responsive teaching principles

DIAGNOSE	MODEL & CONTRAST	TEST PRACTICALLY	REVISIT & TRANSFER
Use talk, product analysis, diagrams and short practical tasks to reveal what pupils currently believe.	Demonstrate the correct concept and compare examples that make the misconception visible.	Use controlled construction, mechanism, circuit, textile or food tests so evidence challenges the belief.	Return to key concepts across units so corrected understanding is applied independently.

Misconception strands

Designing & Research	Making, Tools & Materials	Evaluating & Iteration	Structures, Mechanisms & Electrical	Textiles	Cooking & Nutrition
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Misconceptions are indicative rather than exhaustive. Teachers should distinguish a secure but incorrect idea from a lack of practice, and adapt diagnostic checks while maintaining ambitious technical knowledge.



Designing & Research Misconceptions

Common misconceptions and responsive teaching from EYFS to Year 6

Misconception focus

Common misunderstandings about users, purposes, product research, criteria, specifications, creativity and design communication.

Year group	Linked Park Road unit(s)	Common misconception(s)	Responsive teaching and clarification	Quick diagnostic check
EYFS Nursery & Reception	All themes and continuous provision	There is one correct adult design; drawing must happen before making; choosing a colour is the same as designing.	Model possibilities rather than a product to copy. Accept talk, construction and role play as design communication. Repeatedly connect choices to user, purpose and function.	<i>Ask: "Who is it for, what should it do and what could you try?"</i>
Year 1	All Year 1 units	Design means decorating; the user is always the child making it; criteria are instructions from the teacher.	Contrast appearance with function. Introduce different users and co-create a small set of success criteria. Refer back to criteria during making.	<i>Can pupils name the user, purpose and one functional criterion?</i>
Year 2	All Year 2 units	The first idea is automatically the best; a labelled sketch must look realistic; research means copying an existing product.	Generate alternatives and compare them with criteria. Treat sketches as communication tools. Analyse features, then adapt rather than copy.	<i>Can pupils compare two ideas and explain which better meets the user's needs?</i>
Year 3	All Year 3 units	A design brief and criteria are the same; annotations only name materials; historical products should be copied exactly.	Separate the overall problem from measurable features. Model annotations that explain function, joining and dimensions. Use context as inspiration for a new product.	<i>Can pupils identify the brief and two criteria, then explain a design decision?</i>
Year 4	All Year 4 units	A prototype should look finished; aesthetic choices are unimportant in engineering; recipe adaptation is random substitution.	Use quick prototypes to answer specific questions. Teach function and appearance as linked requirements. Change one recipe variable at a time and predict effects.	<i>Can pupils state what the prototype or trial is intended to test?</i>
Year 5	All Year 5 units	Market research means asking friends what colour they like; more features always improve a product; technical diagrams are decorative.	Model purposeful questions about user problems and competitor performance. Evaluate feature value and constraints. Use diagrams to communicate components, dimensions and assembly.	<i>Can pupils show how research changed one measurable part of the brief?</i>
Year 6	All Year 6 units	Independent design means no references or feedback; a specification is a wish list; innovation must be completely original.	Define independence as informed decision-making. Make specifications measurable and prioritised. Discuss innovation as a useful improvement or new combination for a user.	<i>Can pupils test each specification point and justify one design compromise?</i>

Teaching note: Avoid correcting misconceptions only through verbal explanation. Use products, diagrams, side-by-side comparison, teacher modelling and short controlled tests so pupils can experience why the corrected idea is more useful.



Making, Tools & Materials Misconceptions

Common misconceptions and responsive teaching from EYFS to Year 6

Misconception focus

Common misunderstandings about accuracy, tool selection, joining, safe manufacture, material properties and practical independence.

Year group	Linked Park Road unit(s)	Common misconception(s)	Responsive teaching and clarification	Quick diagnostic check
EYFS Nursery & Reception	All themes and continuous provision	More glue makes a stronger join; every tool can be used for any job; a collapsed model is a failure.	Compare small secure joins with excessive adhesive. Model purpose-specific tools. Treat collapse as useful testing information and rebuild.	<i>Offer two joining methods: can the child choose and explain which works better?</i>
Year 1	Stable structures; Puppets; Fruits and vegetables	Scissors cut all materials equally; sewing is threading decoration; speed is more important than accuracy.	Compare tool suitability and fabric behaviour. Model stitch as repeated joining through layers. Use slow demonstration, cutting lines and safe hand positions.	<i>Can pupils select a suitable tool and show a secure join rather than a decorative thread?</i>
Year 2	Baby Bear's chair; A balanced diet; Fairground wheel	Measuring can be guessed; pressing pieces together creates a permanent join; wheels should be fixed tightly to the frame.	Model measure-mark-check. Compare temporary and permanent joins. Show that wheels rotate around an axle and need clearance from the chassis.	<i>Can pupils identify which part should rotate and which should remain fixed?</i>
Year 3	Eating seasonally; Cushions; Constructing a castle	A template includes the seam allowance automatically; thicker card is always stronger; food tools need no technique.	Mark seam allowance explicitly. Compare strengthening by shape and reinforcement rather than thickness alone. Model controlled cutting and measuring ingredients.	<i>Can pupils explain one accuracy check before cutting or assembling?</i>
Year 4	Pavilions; Adapting a recipe; Gears and pulleys	Extra tape fixes weak structure; gears work even when teeth do not mesh; changing several recipe ingredients gives useful comparative evidence.	Strengthen through triangulation, bracing and precise joints. Demonstrate gear alignment and spacing. Use controlled variables in food trials.	<i>Can pupils identify the structural or mechanical cause rather than adding more adhesive?</i>
Year 5	Doodlers; Gears and pulleys; Developing a recipe	A circuit fault means the battery is flat; tighter belts always improve pulleys; precise quantities do not matter in recipe development.	Troubleshoot one component and connection at a time. Test belt tension and alignment. Measure and record quantities so trials can be compared and repeated.	<i>Can pupils isolate one variable, test it and record the result?</i>
Year 6	Waistcoats; Steady hand game; Come dine with me	Pattern pieces are cut on the seam line; electrical connections work through any material; expert making means never unpicking or remaking.	Model seam allowance and fabric orientation. Test conductors and insulators. Normalise unpicking, adjustment and remanufacture as quality control.	<i>Can pupils explain why a seam, connection or preparation step must be accurate?</i>

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Evaluating & Iteration Misconceptions

Common misconceptions and responsive teaching from EYFS to Year 6

Misconception focus

Common misunderstandings about testing, feedback, evidence, failure, quality and the role of evaluation throughout the design process.

Year group	Linked Park Road unit(s)	Common misconception(s)	Responsive teaching and clarification	Quick diagnostic check
EYFS Nursery & Reception	All themes and continuous provision	Evaluation means saying whether it is pretty; if it breaks, it should be discarded; adult praise proves it works.	Use functional language: stable, strong, moving, fitting, tasting. Repair or redesign after problems. Ask the intended user to try the product.	<i>Can the child identify a problem and make a change that affects function?</i>
Year 1	All Year 1 units	Testing happens only at the end; 'I like it' is evidence; improvement means adding decoration.	Test materials and components before final assembly. Use criteria-based sentence stems. Require a functional improvement such as stronger, safer or easier to use.	<i>Can pupils link a test result to a change in function?</i>
Year 2	All Year 2 units	A failed load or movement test means the project is unsuccessful; feedback must always be followed; one test proves reliability.	Frame failure as evidence. Teach pupils to accept or reject feedback against criteria. Repeat tests under similar conditions.	<i>Can pupils explain what the failed test revealed and what they will change?</i>
Year 3	All Year 3 units	Evaluation is a written paragraph after making; existing products are judged only by appearance; user feedback replaces technical testing.	Embed pause-test-refine points. Analyse function, material and manufacture. Combine user feedback with seam, structure, food and durability tests.	<i>Can pupils show an improvement made during manufacture and the evidence behind it?</i>
Year 4	All Year 4 units	The best prototype becomes the final product unchanged; sensory evaluation is personal preference only; fastest movement is always best.	Use prototypes to discover limitations. Compare sensory attributes using shared scales. Link mechanical performance to user and purpose, not maximum speed alone.	<i>Can pupils describe a trade-off and justify the selected outcome?</i>
Year 5	All Year 5 units	Iteration means making the same product again; fault diagnosis is trial and error; market popularity proves quality.	Record deliberate changes between versions. Use systematic checks and one-variable tests. Evaluate reliability, function, user need and constraints as well as preference.	<i>Can pupils identify the cause of a fault and the evidence for the next change?</i>
Year 6	All Year 6 units	Quality control is only final inspection; meeting most specification points is enough without explanation; sustainability is separate from evaluation.	Use checks before, during and after manufacture. Prioritise specifications and explain compromise. Evaluate material, waste, durability, energy and food choices.	<i>Can pupils provide evidence for each specification point and explain one unresolved limitation?</i>

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Structures, Mechanisms & Electrical Misconceptions

Common misconceptions and responsive teaching from EYFS to Year 6

Misconception focus

Common misunderstandings about stability, strengthening, wheels and axles, gears and pulleys, circuits, motors, conductors and interactive products.

Year group	Linked Park Road unit(s)	Common misconception(s)	Responsive teaching and clarification	Quick diagnostic check
EYFS Nursery & Reception	Construction, vehicles, boats and shelters	Tall structures are always strongest; moving a model by hand makes it a mechanism; electricity is stored in switches.	Compare bases, height and balance. Identify a mechanism as connected parts that control movement. Explore switches as components that open or close a circuit.	<i>Can children change the base to improve stability or identify the moving parts?</i>
Year 1	Structures: Stable structures	Heavy materials are always stable; a narrow tall base can be fixed by decoration; all natural structures are weak.	Test shape, width and centre of mass using similar materials. Separate structural from decorative features. Compare natural structures such as trees, shells and nests.	<i>Can pupils predict which base will be most stable and explain why?</i>
Year 2	Baby Bear's chair; Fairground wheel	More layers always strengthen card; the axle and wheel are the same component; wheels turn because the axle holder rotates.	Compare folds, tubes and braces. Name wheel, axle and axle holder separately. Build examples where axle or wheel rotates and discuss the chosen arrangement.	<i>Can pupils point to each component and describe what moves?</i>
Year 3	Constructing a castle	A net is any flat drawing; tabs are decoration; shell structures must be solid inside.	Fold and label valid and invalid nets. Demonstrate tabs as joining surfaces. Compare hollow shell structures with solid blocks for material efficiency.	<i>Can pupils predict whether a net will close before cutting?</i>
Year 4	Pavilions; Gears and pulleys	Triangles are decorative; meshed gears always turn in the same direction; one pulley always reduces the force needed.	Load-test frames with and without bracing. Track adjacent gear direction. Compare fixed and movable pulleys and count supporting rope sections.	<i>Can pupils predict direction and explain what a brace or pulley changes?</i>
Year 5	Doodlers; Gears and pulleys	A motor produces vibration by itself; larger gears always move faster; a loose pulley belt transfers movement efficiently.	Show that an off-centre weight causes vibration. Compare driver/follower ratios. Test belt tension, alignment and slippage.	<i>Can pupils predict speed or movement after changing one component?</i>
Year 6	Steady hand game	Current is used up by the buzzer; touching any wire completes the circuit; insulating tape conducts because it holds wires together.	Use complete and incomplete circuit diagrams. Test conductors and insulators. Trace a continuous conductive path from one terminal to the other.	<i>Can pupils identify exactly where the circuit is completed or broken?</i>

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Textiles Misconceptions

Common misconceptions and responsive teaching from EYFS to Year 6

Misconception focus

Common misunderstandings about fabric properties, templates, stitches, seams, seam allowance, fastenings, pattern pieces and garment fit.

Year group	Linked Park Road unit(s)	Common misconception(s)	Responsive teaching and clarification	Quick diagnostic check
EYFS Nursery & Reception	Puppets, costumes, flags and role play	Fabric cannot form structures; glue is the only join; all fabric behaves the same.	Explore wrapping, weaving, threading, lacing and stiffening. Compare flexible, stretchy, thick and absorbent fabrics. Select joins by purpose.	<i>Can children choose a fabric property and a joining method for a role-play product?</i>
Year 1	Textiles: Puppets	A template is the finished puppet; larger stitches are stronger; decoration should cover weak joins.	Use templates only to create component shapes. Compare stitch length and spacing. Complete structural joining before decoration.	<i>Can pupils pull gently on the seam and identify whether the stitch is secure?</i>
Year 2	Revisited through wider products	Textiles are only for clothing; 'soft' means suitable; fabric cannot be strengthened.	Show textiles in interiors, products and structures. Compare multiple properties. Explore layering, interfacing or folded edges where appropriate.	<i>Can pupils justify fabric selection using a functional property rather than preference?</i>
Year 3	Textiles: Cushions	Seam allowance is wasted fabric; running stitch and cross stitch have the same purpose; stuffing fixes an uneven seam.	Open and inspect finished seams. Distinguish joining and decorative stitches. Test seam security before stuffing and finish corners carefully.	<i>Can pupils mark seam allowance and explain which stitch joins the fabric?</i>
Year 4	Revisited through Pavilions	Textile cladding strengthens any frame; tightest tension is always best; waterproof-looking fabric is waterproof.	Test the frame before covering. Compare sagging, over-tension and suitable tension. Conduct simple water tests and distinguish resistance from waterproofing.	<i>Can pupils explain whether fabric is structural, protective or decorative in the design?</i>
Year 5	Revisited through product development	A paper model predicts fabric behaviour exactly; any fastening works for any user; aesthetic properties matter more than function.	Use fabric prototypes and test flex, stretch and thickness. Evaluate fastening accessibility and security. Balance function, comfort and appearance.	<i>Can pupils identify a limitation of the prototype material?</i>
Year 6	Textiles: Waistcoats	Pattern pieces can be placed in any direction; sewing directly without pinning saves time; a garment fits if it can be fastened.	Discuss grain, direction and layout efficiency. Model pinning and tacking as accuracy controls. Evaluate movement, comfort and seam placement as well as closure.	<i>Can pupils explain one fit adjustment and its effect on the pattern piece?</i>

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Cooking & Nutrition Misconceptions

Common misconceptions and responsive teaching from EYFS to Year 6

Misconception focus

Common misunderstandings about food classification, origins, healthy balance, seasonality, recipe adaptation, hygiene, nutrition and meal planning.

Year group	Linked Park Road unit(s)	Common misconception(s)	Responsive teaching and clarification	Quick diagnostic check
EYFS Nursery & Reception	Food, farm, garden and celebration themes	All sweet food is fruit; washing hands once keeps them clean; tasting means deciding only whether food is liked.	Sort using botanical and everyday categories with age-appropriate language. Repeat hygiene at relevant stages. Describe flavour, texture, smell and appearance.	<i>Can children name an ingredient, a preparation step and one sensory property?</i>
Year 1	Fruits and vegetables	Fruit grows only on trees and vegetables underground; blending removes nutrients; a smoothie is healthy regardless of ingredients or portion.	Explore varied plant parts and growing locations. Explain that processing changes texture, not food origin. Consider ingredient balance and portion.	<i>Can pupils identify where each ingredient grows and justify its inclusion?</i>
Year 2	A balanced diet	Every meal must contain equal amounts of each food group; foods are simply healthy or unhealthy; wraps are balanced because they contain vegetables.	Use proportion rather than equality and discuss frequency and portion. Avoid moral labels. Evaluate the complete combination of ingredients.	<i>Can pupils explain which food groups are present and what may be missing or excessive?</i>
Year 3	Eating seasonally	Seasonal means food grown in the UK; imported food is always bad; local produce is available all year.	Relate seasonality to climate and harvest. Compare impacts without absolute judgements. Use calendars and origins to identify when and where food grows.	<i>Can pupils explain why a food is seasonal in one location but not another?</i>
Year 4	Adapting a recipe	Replacing one ingredient never changes method; adding less sugar automatically improves every product; taste tests do not need shared criteria.	Predict effects on texture, moisture and structure. Discuss whole-recipe nutrition and portion. Use common sensory vocabulary and controlled variables.	<i>Can pupils identify the independent variable and a measurable effect?</i>
Year 5	Developing a recipe	Farm-to-fork is only transport; nutritional value depends on one nutrient; a recipe is developed after one successful cook.	Map production, processing, packaging and retail. Consider multiple nutrients and user needs. Plan repeated trials and record quantities and method.	<i>Can pupils explain what changed between recipe versions and why?</i>
Year 6	Come dine with me	Planning a meal means choosing favourite dishes; cooking order does not affect safety; attractive presentation proves the meal is successful.	Balance guest needs, nutrition, budget, equipment and timing. Use workflows to avoid cross-contamination and cold holding. Evaluate taste, safety, service and presentation.	<i>Can pupils justify menu choices and sequence tasks to serve safely and on time?</i>

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Using the Misconceptions Document

Planning, responsive teaching, assessment and subject leadership

A practical response cycle

1 ELICIT Use a focused question, product, component, ingredient or short practical task to reveal current thinking.	2 MAKE IT VISIBLE Name the misconception neutrally and compare examples so pupils can observe the functional difference.	3 MODEL THINKING Demonstrate both the practical action and the technical or design decision using precise vocabulary.
4 TEST NARROWLY Isolate the misunderstood variable in a low-stakes construction, mechanism, textile, circuit or food test.	5 APPLY & EXPLAIN Ask pupils to use the corrected understanding in their product and explain the evidence.	6 REVISIT Check transfer later with a different material, user, mechanism, structure, circuit or recipe.

What secure understanding should look like

KNOW WHY Pupils explain the relevant user need, technical principle, material property or nutritional concept.	CONTROL HOW Pupils apply tools, techniques and components accurately enough to achieve the intended function.	CHOOSE PURPOSEFULLY Pupils select methods and materials for a user and specification rather than following one procedure.	TEST & TRANSFER Pupils recognise the idea in a new context and use evidence to evaluate and improve.
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Suggested evidence for subject leadership

PUPIL VOICE Can pupils explain why an earlier belief was limited and apply the corrected concept to a new product?	DESIGNS & PRODUCTS Is there evidence of focused tests, comparison, diagnosis and purposeful refinement?	LESSON VISITS Are teachers checking prior knowledge and using practical contrast to address misunderstandings?	ASSESSMENT & CPD Do teachers use recurring misconceptions to inform planning, resources and staff development?
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Alignment: Park Road Academy Design and Technology Long-Term Overview; Kapow Primary Design and Technology progression and unit resources; the National Curriculum for Design and Technology; and the current EYFS statutory framework. This is a responsive teaching guide, not a checklist of errors.