WHOLE SCHOOL DT OVERVIEW

When teaching Design and Technology, projects follow the following steps:

- Explore
- Plan
- Make
- Evaluate

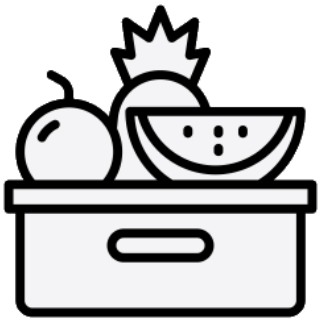
Throughout the year children will also cover key skills focused on the following:

- Lever Mechanisms (Y1)
- Pop Up Mechanisms (Y2)
- Blending and Puréeing (Y3)
- Computer Aided Design (Y3, Y4, Y6)
- Electronics (Y4, Y5, Y6)
- Gears (Y5)

Objectives were created by initially breaking down the areas of the national curriculum and focus on the following key areas:

- **Design**
- **Structures**
- **Mechanisms**
- **Textiles**
- **Food and Nutrition**
- **Electronics**

Skills have been altered and adjusted over two years as projects were developed to consolidate key skills and be more progressive.




Y1

Autumn Term	
Unit Content	Rolling Toy - Structure To create a simple structure or toy that used a cardboard tube securely joined to another component (i.e. wheel or base). Exploring new joining techniques (tabs & brackets) to increase the strength of a model. Building on from exploring the properties of materials with regard to how strong/heavy they are.
Disciplinary Knowledge	Explore • Talk about & explore existing products, identifying what is good or could be improved. • Express personal opinions on products. Plan • Generate simple ideas through talking, drawing, or ICT. • Represent ideas using basic drawings or models. • Consider the purpose of a design (e.g., a bag to carry toys). Make • Begin to join materials using simple techniques. • Use familiar tools and equipment safely. • Create a fixed axel to create a rolling movement. Evaluate • Talk about own work, linking to what went well. • Identify simple ways to improve a product. • Express opinions about the work of others.
Substantive Knowledge	Explore • Begin to identify individual features that affect how products work (e.g., wheel size or position). Plan • Recognise different materials and their basic properties.

Spring Term	
Unit Content	Creating a Moving Picture – Mechanisms To create a 'pop-up book' style card with a moving element a pulley & lever mechanism to create a moving picture. Building upon attaching and joining using glue and tape. Arranging, measuring and sorting materials. Cutting using scissors.
Disciplinary Knowledge	Explore • Generate simple ideas through drawing or ICT. Plan • Represent ideas using basic drawings or models. Evaluate • Talk about own work, linking to what went well. • Identify simple ways to improve a product. • Express opinions about the work of others.
Substantive Knowledge	Explore • Talk about & explore existing products, identifying what is good or could be improved. • Express personal opinions on products. • Generate simple ideas through talking. • Consider the purpose of a design. • Recognise different materials and their basic properties. Make • Begin to join materials using simple techniques. • Use familiar tools and equipment safely.

Summer Term	
Unit Content	Making Fruit Salads - Food & Nutrition To create an “easy to eat on the go” fruit salad, combining fruits with flavours that complement each other and shaping fruit to make them easier to eat with a fork. Introduction to chopping ingredients using the claw technique and consider how they complement each other. Building on mixing & shaping ingredients to create biscuits and/or chips in EYFS.
Disciplinary Knowledge	Explore & Plan • Talk about & explore existing products, identifying what is good or could be improved. • Express personal opinions on products. • Generate simple ideas through talking, drawing, or ICT. • Represent ideas using basic drawings or models. Make • Use familiar tools and equipment safely. • Wash hands and clean surfaces. • Weigh, measure, mix, and prepare food with support. Evaluate • Talk about own work, linking to what went well. • Identify simple ways to improve a product.
Substantive Knowledge	Evaluate • Appreciate how plants are grown and some of the reasons why.

Y2

Autumn Term	
Unit Content	Tower Building – Structure To create the tallest free-standing tower with kebab skewers and a variety of suitable sweets. To use the positioning and shape of a stock set of materials (e.g. kebab sticks, jelly sweets & marshmallows) to strengthen a structure (scaffolding, brace and/or foundations i.e. blue-tac). Building on strengthening joins/structures using tabs and brackets (rolling toy)
Disciplinary Knowledge	Explore • Explain how a product will work in a group discussion. • Evaluate existing products based on use, materials, and how they work. Plan • Develop ideas through talking, drawing, and ICT. • Create simple labelled diagrams. • Explore basic joining techniques. Make • Test products to check if they are a success. • Join materials using adhesives or stitching. • Use different techniques to make products stronger. Evaluate • Talk about own work, linking to what they have been asked to do (simple design criteria) • Explain how a product is successful by linking it to a design criterion.
Substantive Knowledge	Explore • Identify several simple features that affect how products work (e.g., wheel size, position). Plan • Understand that materials have different properties and are chosen for function.

Spring Term	
Unit Content	Raisin Box Racers – Mechanisms To create a car, with a spinning axle, with a sail as a method of propulsion.
Disciplinary Knowledge	Explore • Evaluate existing products based on use, materials, and how they work. • Explain how a product will work in a group discussion. Plan • Develop ideas through talking, drawing, and ICT. • Create simple labelled diagrams. • Use mock-ups & templates to visualise ideas. • Explore basic joining techniques. Make • Cut & shape materials with growing accuracy. • Join materials using adhesives or stitching. • Use different techniques to make products stronger. • Use familiar tools with increasing accuracy. • Create a spinning axle for movement. Evaluate • Talk about own work, linking to what they have been asked to do (simple design criteria) • Test products to check if they are a success. • Explain how a product is successful by linking it to a design criterion.
Substantive Knowledge	Explore • Identify several simple features that affect how products work (e.g., wheel size, position). • Investigate basic mechanisms (rolling axels). Plan • Understand that materials have different properties and are chosen for function.

Summer Term	
Unit Content	Bookmarks (Running Stitch) – Textiles To create a bookmark by using a basic running stitch to make an embroidered design.
Disciplinary Knowledge	Explore • Explain how a product will work in a group discussion. (Looking at existing products.) • Express likes and dislikes. • Evaluate existing products based on use, materials, and how they work. • Develop ideas through talking. • Explore basic joining techniques. (Videos, Techer demonstrations and observations.) • Understand that materials have different properties and are chosen for function. (When looking at existing products.) • Test (Existing) products to check if they are a success. Plan • Explain how a product will work in a group discussion. (During a discussion based on their own designs.) • Develop ideas through talking, drawing, and ICT. • Create simple labelled diagrams. • Use mock-ups & templates to visualise ideas. • Explore basic joining techniques. • Create simple labelled diagrams. • Understand that materials have different properties and are chosen for function. (When considering their own designs.) • Talk about own work, linking to what they have been asked to do (simple design criteria) • Explain how a product is successful by linking it to a design criterion. Make • Cut & shape materials with growing accuracy. • Join materials using adhesives or stitching. • Use different techniques to make products stronger. (Stitching.) • Use familiar tools with increasing accuracy. • Apply running stitch to join fabric. Evaluate • Explain how a product will work in a group discussion. (During a discussion based on their finished product.) • Understand that materials have different properties and are chosen for function. (When evaluating the success of their product.) • Test products to check if they are a success.
Substantive Knowledge	Explore • Identify several simple features that affect how products work (e.g. What is it about a fabric bookmark that works).

Y3

Autumn Term	
Unit Content	Using Nets and Templates to create a prototype (e.g. Picture Frame, Lunchbox, Elf House) - Structure To measure, cut and join materials using different techniques to strengthen a form. Strengthening using cladding (+ introducing rendering) building on the use of tabs & brackets to create a cardboard protype photo frame. Use of measuring. Combining materials (paper, card and glue) to create (joining) and strengthen a frame.
Disciplinary Knowledge	Explore • Understand material properties and their functions. (Existing products. Familiarising themselves with new joining and strengthening techniques (e.g. rendering and cladding) by looking at existing products.) Plan • Generate multiple ideas for a task. • Create detailed sketches with labels. • Plan out steps for making a product. • Understand material properties and their functions. Make • Assemble, join, and combine materials accurately. • Measure, mark, and shape materials with increasing accuracy. • Strengthen 2D products using cladding and rendering. Evaluate • Test products to see if they work as intended. • Identify strengths and improvements. • Begin to compare the final product with the design brief.
Substantive Knowledge	Plan • Understand material properties and their functions.

Spring Term	
Unit Content	Weaving to create a fabric – Textiles To make a piece of fabric using traditional woven techniques. Children learn techniques from other cultures. Children learn how to create their own piece of woven fabric. Consolidate threading a needle and familiarising themselves with materials.
Disciplinary Knowledge	Explore • Evaluate products considering function and suitability for the user. Plan • Generate multiple ideas for a task. • Create detailed sketches with labels. • Plan out steps for making a product. Make • Assemble, join, and combine materials accurately. • Create woven fabric using a loom. Evaluate • Test products to see if they work as intended. • Identify strengths and improvements. • Begin to compare the final product with the design brief.
Substantive Knowledge	Explore • Recognise the purpose of weaving and looms. • Begin to appreciate how products have evolved over time. Plan • Understand material properties and their functions.

Summer Term	
Unit Content	Creating a Crane (with Pulley) – Mechanisms To create a simple crane that distributes the weight it lifts using a fixed pulley mechanism. Building on mechanisms to look at lifting rather than moving items/content
Disciplinary Knowledge	Explore • Evaluate products considering function and suitability for the user. Plan • Create detailed sketches with labels. • Plan out steps for making a product. Make • Assemble, join, and combine materials accurately. • Measure, mark, and shape materials with increasing accuracy. • Strengthen 2D products using cladding and rendering. • Create a simple fixed pulley. Evaluate • Test products to see if they work as intended. • Identify strengths and improvements. • Begin to compare the final product with the design brief.
Substantive Knowledge	Explore • Identify mechanisms used in products. • Understand & explore how pulleys function (mechanical components). • Begin to appreciate how products have evolved over time. Plan • Understand material properties and their functions.

Y4

Autumn Term	
Unit Content	Creating Fake-Away Pizzas To create a fake away pizza with a wrap base using the most popular ingredients from their class. To consider how flavours combine and how to present their toppings to make the overall dish attractive to the consumer. Building on chopping ingredients to shape using the bridge & claw technique. Using an oven to cook safely.
Disciplinary Knowledge	Explore • Evaluate ingredients based on taste, availably & aesthetics. Plan • Create multiple design ideas and refine them. • Use sketches and CAD for clarity. • Plan the making process and required materials. • Develop a simple design criterion as a class. Make • Prepare food safely and hygienically. Evaluate • Identify strengths and weaknesses in a product. • Explain what went well and what could be improved. • Use design criteria for product evaluation. • Taste test & compare to assess if the product meets their design brief.
Substantive Knowledge	Explore • Begin to appreciate the global impact of using sustainable & recyclable materials. Make • Recognise & appreciate some methods & practices to ensure cooking appliances are used safely & efficiently.

Spring Term	
Unit Content	Paddle Boats – Mechanisms To create a paddle boat that is self-propelled using a twirling mechanism. Building on creating a moving vehicle with an axel that was not self-propelled. Introduction of hot glue as an adhesive.
Disciplinary Knowledge	Explore • Evaluate existing products based on design, materials, and function. Plan • Use sketches and CAD for clarity. • Plan the making process and required materials. • Develop a simple design criterion as a class. Make • Select and combine materials to meet design needs. • Measure, mark, cut, and shape materials accurately. • Create a simple wind-up mechanism from plastic. Evaluate • Test & refine products to see if they work as intended. • Identify strengths and weaknesses in a product. • Explain what went well and what could be improved. • Use design criteria for product evaluation.
Substantive Knowledge	Explore • Understand how mechanisms can be used to store & release energy. Plan • Begin to appreciate the global impact of using sustainable & recyclable materials. Evaluate • Understand how mechanisms can be used to store & release energy. • Appreciate how products have changed over time & some reasons for this.

Summer Term	
Unit Content	Plastic Bag Kites – Structures To measure, cut and join materials with different properties to create a kite that flies. Strengthening using cladding (+ introducing rendering) building on the use of tabs & brackets to create a protype (elf house, photo frame, lunch box). Use of cardboard nets & templates.
Disciplinary Knowledge	Explore • Evaluate existing products based on design, materials, and function Plan • Use sketches and CAD for clarity. • Plan the making process and required materials. • Develop a simple design criterion as a class. Make • Test & refine products to see if they work as intended. • Select and combine materials to meet design needs. • Reinforce structures with cladding and rendering. • Measure, mark, cut, and shape materials accurately. Evaluate • Identify strengths and weaknesses in a product. • Explain what went well and what could be improved. • Apply design criteria to product evaluation.
Substantive Knowledge	Explore • Appreciate how products have evolved over time & some reasons for this. • Begin to appreciate the global impact of using sustainable & recyclable materials.

Y5

Autumn Term	
Unit Content	3D Christmas Decoration - Textiles To make a textiles Christmas decoration. To use a blanket stitch to create a textile product within a different context and for a different purpose Children have previously created a fabric bookmark, made their own woven fabric and learned basic stitching techniques.
Disciplinary Knowledge	Explore • Begin to make clear points considering function, cost, and sustainability. • Generate multiple ideas based on research. • Develop design criteria considering feedback. Make • Cut & shape materials with growing accuracy. • Join materials using adhesives or stitching. • Use different techniques to make products stronger. • Use familiar tools with increasing accuracy. • Apply running stitch to join fabric. Evaluate • Test and refine products to assess & improve effectiveness. • Consider functionality, durability, and aesthetics. • Collect feedback for improvement. • Begin to use their own design criteria for product assessment.
Substantive Knowledge	Explore • Consider sustainability of materials and the product life cycle. • Learn about key individuals or events in product innovation. • Begin to use logical reasoning to consider why products have evolved over time. Plan • Explore & combine advanced materials (e.g. Felt, Fabrics and Threads).

Spring Term	
Unit Content	Cam Toy – Mechanisms To create a basic cam toy (building of shaping and joining card to create movement – lift rather than slide) & lifting objects in different ways (pulley vs. CAM). Measuring and shaping wooden dowels (moving from card to wood) with growing accuracy in order to connect pre-cut CAMs. Building on creating movement within a 2D format using sliders to create a moving picture (simple lever mechanism).
Disciplinary Knowledge	Explore • Begin to make clear points considering function, cost, and sustainability. Plan • Generate multiple ideas based on research. • Use CAD or 3D modelling for detailed designs. • Develop design criteria considering feedback. Make • Use various tools and materials to create functional products. • Reinforce and strengthen structures. • Apply finishing techniques for improved aesthetics. • Create a cam mechanism with support. Evaluate • Test and refine products to assess & improve effectiveness. • Consider functionality, durability, and aesthetics. • Collect feedback for improvement. • Begin to use their own design criteria for product assessment.
Substantive Knowledge	Explore • Learn about key individuals or events in product innovation. • Understand how cams & gears function (mechanical components). • Consider sustainability of materials and the product life cycle. • Begin to use logical reasoning to consider why products have evolved over time. Plan • Begin to investigate some benefits of using sustainable materials. • Understand how cams & gears function (mechanical components).

Summer Term	
Unit Content	Buzz Wire Game - Structure & Electronics To create a challenging buzz wire game that successfully incorporates an electrical circuit with a switched via a Raspberry Pi. Pupils to alter the layout of the circuit to make it more compact and add elements to create a break/switch (wire frame). Building on creating a complete circuit using Raspberry Pi components (connector cables, resistor, LED, breadboard).
Disciplinary Knowledge	Explore • Begin to consider products for function, cost, and sustainability. Plan • Use CAD or 3D modelling for detailed designs. • Develop design criteria considering feedback. Make • Use various tools and materials to create functional products. • Reinforce and strengthen structures. • Apply finishing techniques for improved aesthetics. • Build circuits with switches. Evaluate • Test and refine products to assess & improve effectiveness. • Consider functionality, durability, and aesthetics. • Collect feedback for improvement. • Begin to use their own design criteria for product assessment.
Substantive Knowledge	Explore • Consider sustainability of materials and the product life cycle. • Begin to use logical reasoning to consider why products have evolved over time. Plan • Begin to investigate sustainable materials. • Explore & combine advanced materials (e.g., conductors and insulators).

Y6

Autumn Term	
Unit Content	Pumpkin Soup - Food and Nutrition To cook a pumpkin soup that can be served to others - Boiling, Blending, seasoning and purifying ingredients. Children to learn the seasonality of produce and where the ingredients they are using are grown/ harvested. Children learn hazards in the kitchen and health and safety tips. Building on chopping ingredients to shape using the bridge & claw technique and learning to combine ingredients in Y4 Pizzas
Disciplinary Knowledge	Explore • Evaluate products for function, cost, and sustainability. (Seasonality of vegetables and how this applies to cost and availability.) Plan • Refine designs through testing and adjustments. • Prepare and cook food using different techniques. • Identify hazards and solutions in design. Make • Prepare and cook food using different techniques. • Refine designs through testing and adjustments. Evaluate • Test (including tasting), refine and assess if the product meets their design brief. • Identify strengths, weaknesses, and improvements. • Gather external feedback. • Consider additional ingredients or seasoning for taste.
Substantive Knowledge	Explore • Identify hazards and solutions. • Consider the impact of products beyond intended purpose. • Consider seasonality and food sourcing using comparison of ingredients.

Spring Term	
Unit Content	Mechanical Samaras - Mechanisms To create a leaf that can be wound up and twirls when released. The manipulation of wire on a smaller and more complex scale. Reapplication of a twirling mechanism using more components (4 instead of 2). Wire has also been cut and manipulated to create a larger structure when creating a buzz wire game.
Disciplinary Knowledge	Explore • Evaluate products for function, cost, and sustainability. Plan • Generate and refine ideas using research and feedback. • Use detailed sketches, CAD, and prototypes. • Plan the entire making process, considering challenges. Make • Use a variety of tools and materials for robust products. • Refine designs through testing and adjustments. • Apply finishing techniques for function and aesthetics. • Create a wind-up mechanism from strong materials (metal). Evaluate • Test (including tasting), refine and assess if the product meets their design brief. • Identify strengths, weaknesses, and improvements.
Substantive Knowledge	Explore • Understand how mechanisms can be used to store & release energy in different directions. • Consider the impact of products beyond intended purpose. • Identify hazards and solutions in design. Plan • Investigate different benefits for using sustainable materials.

Summer Term	
Unit Content	Bug Hotels – Structures To create a usable bug hotel using sustainable resources. Children apply Cutting, joining & strengthening knowledge to create a wooden bug hotel. They select materials that are fit for purpose & consider their sustainability. Children have learned joining techniques (tabs, brackets, cladding and rendering) and learned how to create a prototype frame that can be applied in a different context to this structure.
Disciplinary Knowledge	Explore • Evaluate products for function, cost, and sustainability. Plan • Investigate different benefits for using sustainable materials. Make • Use a variety of tools and materials for robust products. • Refine designs through testing and adjustments. • Apply finishing techniques for function and aesthetics. Evaluate • Test (including tasting), refine and assess if the product meets their design brief. • Identify strengths, weaknesses, and improvements. • Gather external feedback. • Consider additional ingredients or seasoning for taste.
Substantive Knowledge	Explore • Identify hazards and solutions in design. • Consider the impact of products beyond intended purpose. • Analyse advanced materials and technologies. • Use logical reasoning to consider why products have evolved over time Plan • Generate and refine ideas using research and feedback. • Use detailed sketches, CAD, and prototypes. • Plan the entire making process, considering challenges.

EYFS

In the Early Years Foundation Stage, Design and Technology forms part of the 'Expressive Arts and Design' category. Through daily continuous provision within class, children are provided with a multitude of opportunities to explore and develop their early design and technology skills. The daily, engaging tasks provided will enable our children to build on their previous learning and exploration, as well as beginning to refine and develop their skills. Collaborative learning is encouraged through child-initiated learning and is the platform for our children to create and share their ideas with their peers as they investigate a variety of resources and tools.

Our staff also encourage Design and Technology with an adult-led approach, incorporating the projects, designed with EYFS in mind, that encourage our children to reflect and discuss their ideas. It also allows for discussion and problem solving as a group whilst providing a range of tools and materials to discover and explore. All of the skills our children are provided and encouraged with, will support them in their progression into KS1, where the foundation of these skills will be further built upon and developed. Pupils also complete the following projects that focus on the following specific areas of Design and Technology:

- **Food and Hygiene:** Baking biscuits
- **Structure:** Exploring different materials linked the 3 little pigs.
- **Textiles:** Exploring textiles and materials to make dolly peg characters.

The Base & Thrive Provisions

Thrive, Yellow & Blue Base complete simplified and/or scaffolded versions of selected projects from KS1 or lower KS2 that are tailored to their ability and allow children experience of each strand. Some children from these provisions also access the subject with their mainstream class. Pupils within the provisions follow the equals curriculum so the objectives based on the national curriculum are not appropriate for some pupils. Alternatively, pupils develop their skills and understanding as part of wider topics & content within the formal and semi-formal curriculums.

Semi-Formal Equals Curriculum – DT Links

1. My Art

- Art develops a visual, tactile, and sensory vocabulary, helping students express themselves through various artistic means.
- Encourages creativity and imagination through visual, tactile, and sensory experiences.
- Uses different materials and processes such as painting, drawing, sculpting, printing, textiles, and digital media.
- Promotes exploration and risk-taking, key components of DT, as students experiment with artistic techniques and tools.
- Focuses on the process rather than the final product, aligning with DT methodologies of iterative design and prototyping.
- Encourages independence and hands-on learning, fostering practical problem-solving skills.

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2. My Cooking / Food Technology

- Emphasizes both skill-based and process-based learning, which mirrors DT's focus on design, iteration, and functionality.
- Develops core kitchen skills such as spreading, cutting, chopping, dicing, and using various kitchen tools and appliances.
- Encourages students to work independently and develop problem-solving abilities, essential for DT projects.
- Highlights the importance of health and safety, hygiene, and correct use of equipment, which are key elements in DT workshops.
- Promotes creativity in food preparation and presentation, linking to design principles.
- Suggests the importance of a dedicated space (kitchen) with proper tools and materials, similar to a DT lab or workshop.

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3. My Creativity

- Defines creativity as a journey of exploration and problem-solving.
- Encourages innovation, imagination, and engagement with challenging experiences, much like DT.
- Highlights the importance of play, experimentation, and hands-on experiences in the creative process.

- Discusses how students should be given time to explore and develop their own ideas, similar to iterative design in DT.
- Introduces the concept of 'Small c' creativity (everyday problem-solving) and 'Big C' creativity (designing meaningful products or performances).
- Supports the idea that creativity is for everyone, regardless of ability, which aligns with DT's inclusive and exploratory nature.

These extracts highlight the strong connections between Art, Food Technology, Creativity, and Design & Technology (DT), emphasizing problem-solving, hands-on learning, and practical application of skills.

Formal Equals Curriculum – DT Links

Design and Technology (DT) Related Content from EQUALS Formal Curriculum

1. Cooking and Kitchen Skills (Independence Curriculum)

- **Using Kitchen Equipment**: Learners are taught how to safely and effectively use kitchen tools and appliances, including blenders, microwaves, and ovens.
- **Material Handling and Safety**: Working with different cooking materials (e.g., plastic, metal, ceramic) and understanding heat conduction and insulation.
- **Problem-Solving in Cooking**: Following recipes, adjusting ingredients, estimating quantities, and handling unexpected cooking challenges.
- **Dealing with Accidents**: Learning how to handle spills, burns, and broken materials safely.

2. Outdoor Schooling (Practical Construction and Creativity)

- **Shelter Building**: Learners engage in hands-on construction by designing and building simple shelters using wood, tarpaulins, and natural materials.
- **Making a Fire**: Understanding fire safety, gathering appropriate materials, and using tools such as fire steels or matches.
- **Problem-Solving and Innovation**: Encourages students to adapt to different weather conditions, select appropriate materials, and modify structures based on needs.

3. Digital Media and Technology (The World About Us Curriculum)

- **Digital Photography**: Students learn to use cameras, adjust settings, and capture images.
- **Editing and Presentation**: Using software to enhance and organize digital media.
- **Practical Application**: Encourages creativity in presenting findings and documenting learning experiences.

4. Hands-on Problem Solving and Creativity

- **Making and Using Tools Safely**: Understanding the function and proper handling of tools such as hammers, saws, and peelers in a controlled environment.
- **Environmental Awareness and Sustainability**: Understanding materials' sources, how to reuse and recycle, and making eco-conscious design choices.
- **Practical Design Thinking**: Encouraging learners to plan, build, test, and refine their ideas in real-world applications.

This collection of content highlights practical skills that align with **Design and Technology**, encouraging problem-solving, creativity, and hands-on learning.