TEACHING FOR CREATIVITY IN DESIGN AND TECHNOLOGY FOR YEAR 1

UNIT OF WORK EXEMPLAR

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How to read this document

This document contains three main components

- A description of the Creativity Collaborative programme context and our framework of teaching for creativity
- The key unit information provides an overview next
- Finally, the full unit description gives detailed information

UNIVERSITY OF WINCHESTER
UNIVERSITY OF WINCHESTER ACADEMY TRUST
CREATIVITY COLLABORATIVES
LOTTERY FUNDED
Supported using public funding by ARTS COUNCIL ENGLAND
Freelands Foundation

Context: UWinAT Creativity Collaborative

Creativity Collaboratives is an action research programme, funded by Arts Council England and the Freelands Foundation, that aims to build networks of schools to test a range of innovative practices in teaching for creativity, with the explicit intention that learning is shared to facilitate system-wide change. The University of Winchester, the University of Winchester Academy Trust, and a network of Hampshire Infant, Junior and Primary schools became one of the eight national funded collaboratives, coming together with the key ambition of fostering pupils' creativity in subjects drawn from across the curriculum. Overall, our collaborative aims to enrich children's life chances by developing them into confident and creative problem-solvers, engaging them through authentic, meaningful problems, embedded in their schools and lives.

The focus on creativity as a key skill in education is increasing (James et al., 2019), reflecting its value within wider society. Indeed, according to the 2023 'Future of Jobs Report' (World Economic Forum, 2023) creative thinking is the skill showing the greatest increase in importance for employers (p. 38) and after analytical thinking, is the second most frequently cited skill that is 'core' for the workplace (p. 39). Our collaborative has focused on:

- Understanding and addressing the barriers and enablers of creative thinking
- Developing leadership for creativity in schools
- Developing new approaches to teaching for creativity across the curriculum
- Building children's and teachers' knowledge and understanding of creativity
- Developing children's and teachers' sense of themselves as creative and their ability to be creative in subjects across the school curriculum..

The Creativity Navigator: A Framework of Teaching for Creativity

To support our planning and implementation of teaching for creativity, we use a planning tool called the Creativity Navigator (see back cover). This was co-developed in our Creativity Collaborative and draws on a wide range of models, theories and frameworks of creativity. The Navigator emphasises that creativity can be a planned for process, that follows a typical sequence of explore – ideate – evaluate, but that this sequence can be varied and cycled around many times whilst working through a creative process. The process starts with the question 'where next?' emphasising the importance of metacognitive planning and monitoring throughout a creative process.

In a classroom context, a creative process can be operationalised through a set of learning behaviours. These behaviours can be grouped under creative 'habits' each of which can be used to support the creative process. For instance, a think-pair-share learning behaviour could support children to collaborate on gathering relevant information as they explore at the beginning of a creative learning task. The same collaborative habit could later be used to support the evaluate stage of the creative process through getting constructive feedback from peers on each other's creative work and how it might be improved further.

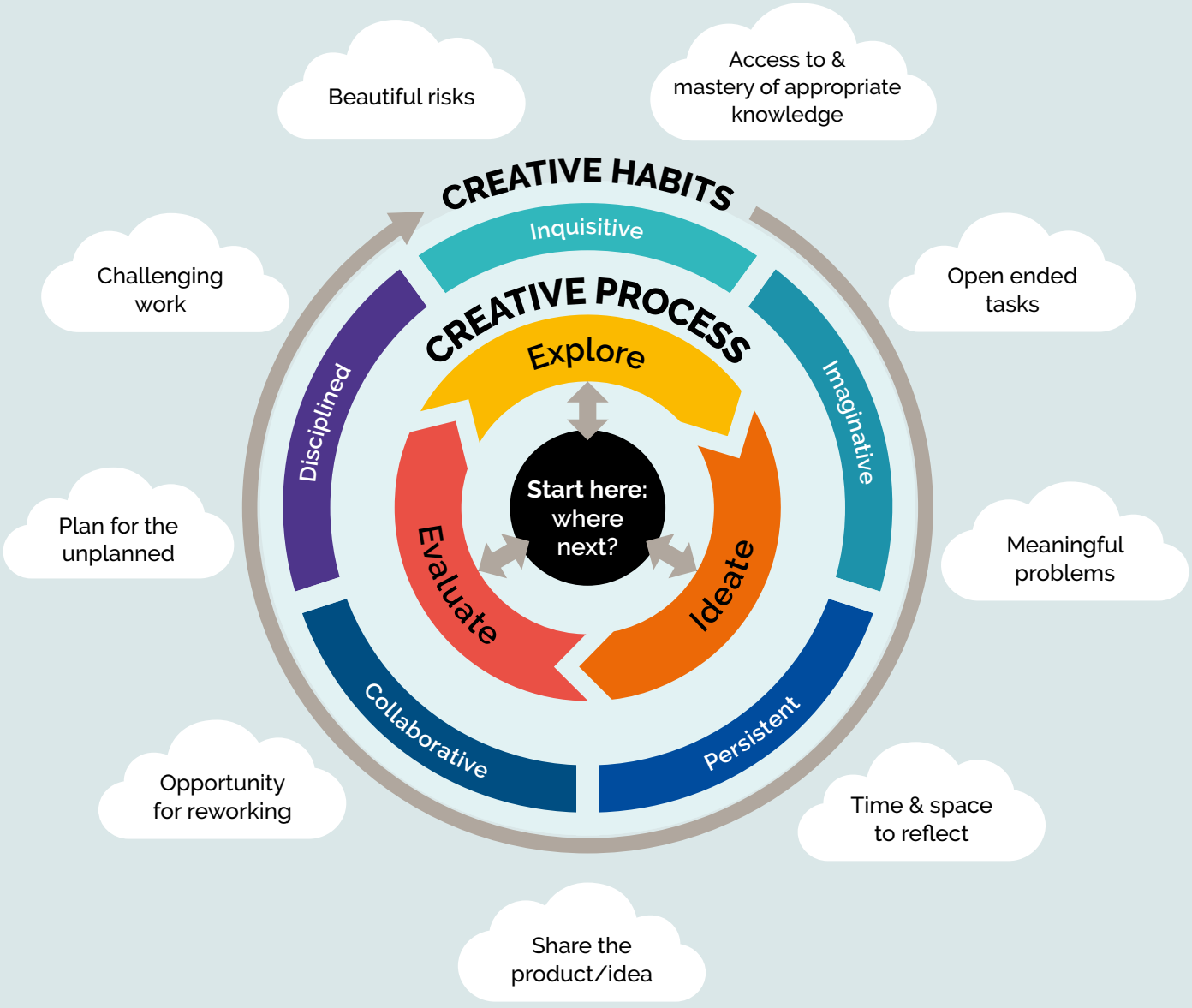
The final aspect of our Creativity Navigator focuses on the types of climate and task design that can support creativity to flourish in the classroom. For instance, tasks need to be personally meaningful, challenging, and open-ended, with children having some autonomy over aspect(s) of their learning. The classroom climate needs to provide psychological safety for children to take risks, make mistakes, learn from them and rework.

TO CITE THE CREATIVITY NAVIGATOR PLEASE USE:

Sowden, P.T., Warren, F., Seymour, M. Martin, C., Kauer, A. Spencer, E., Mansfield, S., Waite, J. (2025). A Creativity Navigator to Guide Teaching for Creativity: Implementation and Teacher Impacts in a Creativity Collaborative of Schools. *Journal of Creative Behavior*, 59(2), e70005. **https://doi.org/10.1002/jocb.70005**

To refer to this resource please cite: Williams, G. (2025). Roaming Rovers: A Case Example of Teaching for Creativity in Year 1 Design and Technology. Orchard Infant School, Dibden Purlieu, Southampton, UK: UWinAT Creativity Collaborative.

CREATIVITY NAVIGATOR



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KEY UNIT INFORMATION

Roaming Rovers

INTENDED FOR:
Year 1/ KS1

SUBJECT FOCUS:
Design and Technology

UNIT DURATION & FORMAT:
5 week unit

LEARNING OBJECTIVES/OUTCOMES:

1. Learning objectives/outcomes:
   a. **To identify the use and purpose of a product**
   To explain why a product, such as a rover, is needed (e.g NASA needing a new rover to explore a new planet). To generate a design criteria to ensure the vehicle is appealing, purposeful, and functional, taking into account the needs of the user and its intended purpose.
   b. **To identify and understand the components of a vehicle**
   To identify the key components of a vehicle, such as the body, chassis, wheels, and axles, and describe how each component functions. They will apply this knowledge to create their own working wheels and axles, understanding how these parts work together to make a vehicle move.
   c. **To generate, communicate, and develop design ideas through the iterative process**
   To generate a range of ideas for a rover model and communicate their ideas through a labelled diagram. They will use the Design-Make-Evaluate process to test, adjust, and improve their rover design before creating a final, functional product.
2. Creative Outcome:
   Children will explore the purpose and design of rovers, using their imagination to ideate and evaluate unique models. Through the **explore**, **ideate**, and **evaluate** process, they will experiment, adapt, and refine their ideas to create a final product that reflects their individuality. The result will be diverse and innovative rover models, showcasing their creativity.

Get ready to become NASA engineers in the making! After an exciting news broadcast from NASA, the children will be challenged to design and create a brand-new rover to explore Vortex, a newly discovered planet. Embarking on a creative journey of explore, ideate, and evaluate, the children will pose critical questions such as: What is the terrain like on Vortex? What might a rover need to navigate it? How will it collect and store samples? Using these questions to guide their thinking, they will edit, craft, morph, and improve their designs, each iteration bringing them closer to their final masterpiece. The children will carefully consider how their rovers will function, selecting features like pots or bags for storing samples and designing arms or grabbers to collect materials from the planet's surface. They'll experiment with different materials, testing for durability, strength, and suitability for the rover's environment. Through these decisions, they'll ensure their designs are not only innovative but also fit for purpose.

Throughout this exciting challenge, the children will master fundamental DT skills, combining disciplinary knowledge (how to test, evaluate, and refine designs) with substantive knowledge (understanding materials, mechanisms, and functionality). Their learning and attainment soared as they applied these skills in real-world contexts, and this was clearly evident in their impressive final products. The project will culminate in an exciting Roaming Rover Reveal, where the children will present their prototypes, showcase interactive video tutorials, and display their designs in a gallery. To top it off, their rovers will be demonstrated on a planet surface simulator, putting their hard work to the ultimate test in this thrilling NASA-inspired challenge!

STEPS FOR SUCCESS:

1. **Think ahead and get organised:** Ensure you have a wide variety of resources ready for the children to explore. Reach out to parents for donations or help gathering materials to give children the freedom to choose from a rich selection.
2. **Prioritise time for evaluation:** Build in regular opportunities for children to reflect and evaluate their ideas throughout the learning journey, not just at the end. This will help them refine and improve their designs step by step.
3. **Let go and give control:** Once the children are secure in the knowledge they need, step back and let them take ownership of their designs. Trust their creativity to shine as they make independent decisions and bring their ideas to life.

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FULL UNIT DESCRIPTION

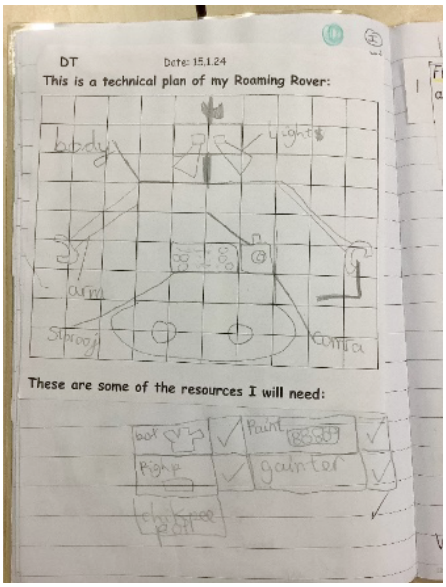
Roaming Rovers

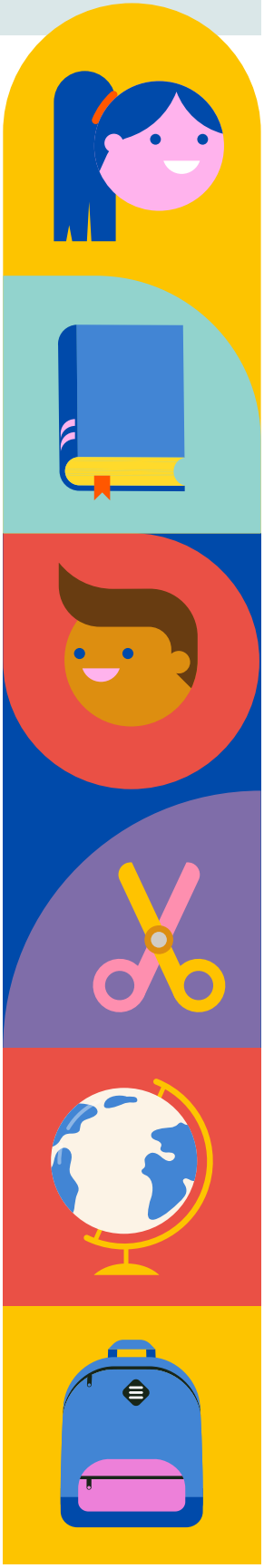
Introduction

This thought-provoking and creative 5-week unit of work, 'Roaming Rovers', seamlessly integrates three subject areas: DT, English, and Science, to support children's exploration of materials. Inspired by an exciting news broadcast from NASA, the children are tasked with designing a rover to explore a newly discovered planet.

The journey begins with learning about the components of a vehicle and discovering how wheels and axles work in DT. Over the 5 weeks, the children delve into the explore, ideate, evaluate cycle, continually crafting, improving, and morphing their rover designs before creating their final product. They master the iterative process, learning special joining techniques such as L braces and flanges to enhance the functionality of their designs. In Science, the children investigate the properties of materials, testing their strength, transparency, and reflectiveness to make informed decisions about which materials are best suited for their rovers. Meanwhile, in English, the project is brought to life through instruction writing on how to build their rovers and letters to NASA, updating them on progress and sharing their creative ideas.

This unit has evolved over time, transforming from a simple task of assembling wooden dowels, cotton reels, and cardboard boxes into a dynamic, creative journey. By teaching this project through a creative lens, children have been empowered to unleash their imaginations, resulting in diverse, innovative rover designs that showcase just how inventive and resourceful they can be when given the opportunity. 'Roaming Rovers' is truly a project that inspires creativity from start to finish!





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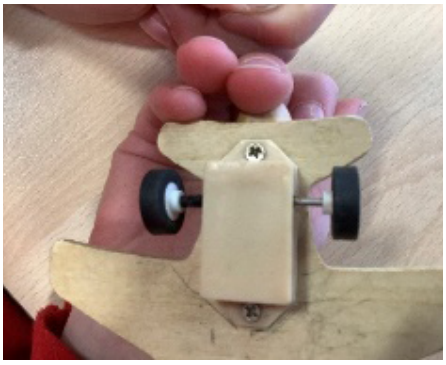
Explore Stage

In the explore stage of the 'Roaming Rovers' unit, the children dive into their learning by asking thought-provoking questions such as: What does a rover look like? What makes a vehicle move? How do the wheels work on a vehicle? They begin by investigating toy vehicles, examining wheels, axles, and components, and learning how these parts work together to make a vehicle move. After creating their initial rover designs, they revisit the explore phase, asking new questions like: What would make good wheels for my rover? They experiment with various materials such as balls, celebration tubs, Coke cans, toilet rolls, and anything else that could serve as potential wheels. Through investigation and evaluation, they select the best option for their rover.

Once this challenge is complete, the children are posed yet another question: How will my rover collect and store samples? Exploring storage solutions from their classroom, they examine items like pencil pots, tubs, trays, and bags, thinking creatively about how these could be adapted for their rover. These ideas are then added to their evolving designs.

This explore stage is a continuous, cyclical process throughout the project, with new questions and challenges emerging at every step. By repeatedly returning to the explore phase, the children build a deep understanding of materials, components, and design, ensuring their final rovers are innovative, functional, and fit for purpose.



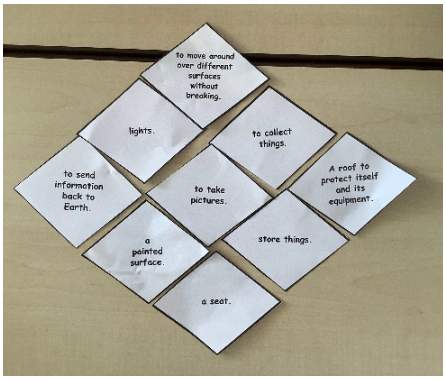
Ideate Stage

The ideate stage in the creative process was never stagnant. What started as a basic rover design on day one of the project evolved drastically into a detailed and thoughtful final technical plan, drawn just moments before they began making their rovers. The children were not shown images of real rovers, as we wanted to preserve and nurture their creativity. Having never seen an actual rover, their ideation flourished, and they developed unique ideas without limitations.

After each stage of exploration, the children returned to their designs, making adaptations and improvements. They continually referred back to their design criteria, ensuring that their ideas aligned with the rover's intended function and purpose. After the initial hook, the children began by drawing what they thought a rover might look like. They also worked in groups to create a diamond 9, ranking the most important features for a rover, which guided their overall design criteria.

Then, collaboratively, they sketched and wrote their ideas on sugar paper, considering the components of toy vehicles they had explored and thinking about the terrain and climate of the new planet. Some children even designed canopies for rain protection or wings for navigating lava-filled surfaces. These ideas evolved over time as they reflected and drew multiple rover possibilities.

Following this, the children reflected on all their ideas and selected one design to move forward with. After further exploration of storage solutions, they added and adapted their design, refining it until they had their final rover concept. When it was time to make their rovers, the children displayed resilience, often stepping back to ask questions, make decisions, and justify their choices. Some elements were added, others removed, and they learned to reason behind each change. The final rovers were a testament to their creativity and problem-solving skills—unique and fit for purpose, showcasing the incredible journey from idea to finished product.



Evaluate Stage

The evaluate stage of the process was ongoing throughout the project as the children regularly stepped back to reflect on whether their rover designs were effective. Some children decided to remove elements they felt were no longer fit for purpose, while others added features they realised they had missed. At the Roaming Rover Reveal, the children put their rovers to the test, navigating them over different terrains to assess their durability.

To evaluate their final designs, the children used a star system, reflecting on how well their rovers met the design criteria. It was wonderful to see the children evaluating critically and honestly, discussing what worked well and what they would do differently next time. They also took time to evaluate their creativity, and it was fantastic to see all of their rovers displayed side by side, with children commenting on how each design was unique yet effective in its own way.

When shown real NASA rovers, such as the Perseverance Rover exploring Mars, the children proudly remarked that they liked their own rovers better, demonstrating their confidence and pride in their creative solutions. The evaluation process not only reinforced the importance of critical thinking and reflection but also celebrated the individuality and innovation each child brought to their rover design.

> **"I wish I could share every single child's final rover picture to showcase just how impactful this project has been."**

Challenges

The only challenge within this project is that it takes time. I feel incredibly lucky to work in a school where our curriculum is designed in blocks, allowing the children to fully immerse themselves in DT, English, and Science throughout the entire 5-week project. This structure gives them almost every afternoon for 5 weeks to morph, change, adapt, and refine their rovers, which is crucial for the success of this process. While there are a few science lessons that feed into the DT aspect, the majority of time is dedicated to hands-on learning and experimentation.

I can see how this project could be much more challenging if it were taught just once a week. The children need ample time to make mistakes, reflect, and learn from those mistakes. For the project to be truly effective—like it has been for us—it requires a longer time frame. This extended period allows the children to evaluate their progress continually, make improvements, and deeply engage with the iterative design process. Time is essential for them to truly own their learning, and this longer approach has been key to the success and creativity we've seen in their final rovers.

Impact on learning

The impact of this incredible project has been phenomenal, and I cannot express enough how all the children achieved so highly in DT. They fully took ownership of their learning journey, and each child flourished. I wish I could share every single child's final rover picture to showcase just how impactful this project has been—teaching it in such a creative way and allowing the children to take charge. Not only were their rovers incredibly creative and unique, but the children also securely met all the DT and Science requirements throughout the process.

When discussing their final rovers, all our children – including those with SEND – were able to confidently explain what each component was, its purpose, and why it deserved a place on their rover. It was inspiring to see children who might otherwise present as withdrawn or disengaged truly come to life during this project.

What stood out even more was that our SEND and vulnerable groups of children made accelerated progress in their writing too! Their eagerness to write to NASA, updating them on their rover progress, or documenting their journey through instructions, demonstrated the power of engagement. This project showed us that when children are fully invested and given ownership of their learning, their attainment excels in ways we never imagined.

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Supporting evidence of impact

The children were so deeply immersed and hands-on during this project, and it has been an emotional journey watching them thrive and showcase their incredible ideas. As a teacher, you step back and watch 30 little busy children apply everything they've learned, and you can't help but smile because that's where true learning takes place—when it's in the hands of the children to show you what they can do.

The comments from our deputy and headteacher were heartwarming, as they noted how the children's learning was creative, unique, and purposeful. Parents also shared how much the children had been talking about the project at home. The children themselves spoke about their collaborative efforts, with one child saying, "Do you need some help? I have an idea—why don't you try sticking your arm on with a flange join?" It was wonderful to hear them encouraging each other.

What truly stood out was how the children reflected on their own perseverance and discipline. This project provided an opportunity for them to feel "stuck" and learn how to find their own way out of difficult situations. One child spent an entire afternoon trying to attach their rover's body, while another dedicated hours to finding the perfect components from a pile of junk. These moments of persistence were truly inspirational, and the children learned far more than we ever anticipated, especially in terms of creative habits and problem-solving skills. It was a reminder of just how powerful hands-on, creative learning can be.

FINAL REFLECTIONS:

Reflecting on this project and the changes made through the use of the creative process, I can wholeheartedly say that the children have had ample opportunities to show their innovative ideas and demonstrate mastery within DT. If we were to rewind just two years ago, before my awareness of the creativity project, it's mind-blowing to think that we simply showed the children rovers, collected 30 cardboard boxes for them, gave each child 4 cotton reels for wheels, and told them step-by-step how to make their rover. There was zero creativity and zero ownership in that approach. Fast forward to now, and we have 30 unique, imaginative rovers—each one different and incredible in its own right.

The children used celebration tubs, coke cans, and tin lids for wheels, and their rover bodies took on all sorts of shapes—spheres, cuboids, cylinders. Some rovers had grabbers, hoovers, diggers, or arms to collect samples, with a whole variety of additional features. One child even designed diamond catchers after learning that some planets might rain diamonds, and she was determined to ensure her rover could collect them and bring them back to her!

It's amazing to think about how far we've come, and this feels like the missing jigsaw piece in education. If we want to foster creative, problem-solving adults in the future, it all starts here, now, in school. These are the opportunities children need. They need to know that this is what teachers and our education system value. We value difference, we value uniqueness, we value failure, we value resilience, and we value imaginative ideas. Once the children know that and are given the space to demonstrate their creativity, they truly flourish. This project has proven just how much they can achieve when they are given the freedom to be themselves.

CONTACT US:

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https://www.winchester.ac.uk/research/Our-impactful-research/Research-in-Humanities-and-Social-Sciences/Research-projects/creativity-collaborative/

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