TEACHING FOR CREATIVITY IN SCIENCE FOR YEAR 3

UNIT OF WORK EXEMPLAR

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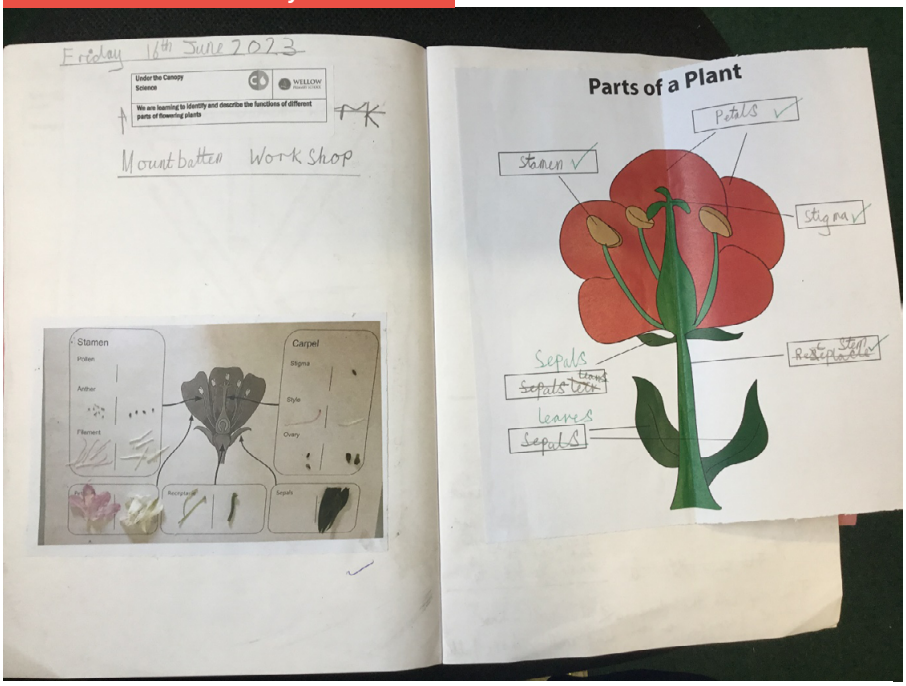


How to read this document

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.

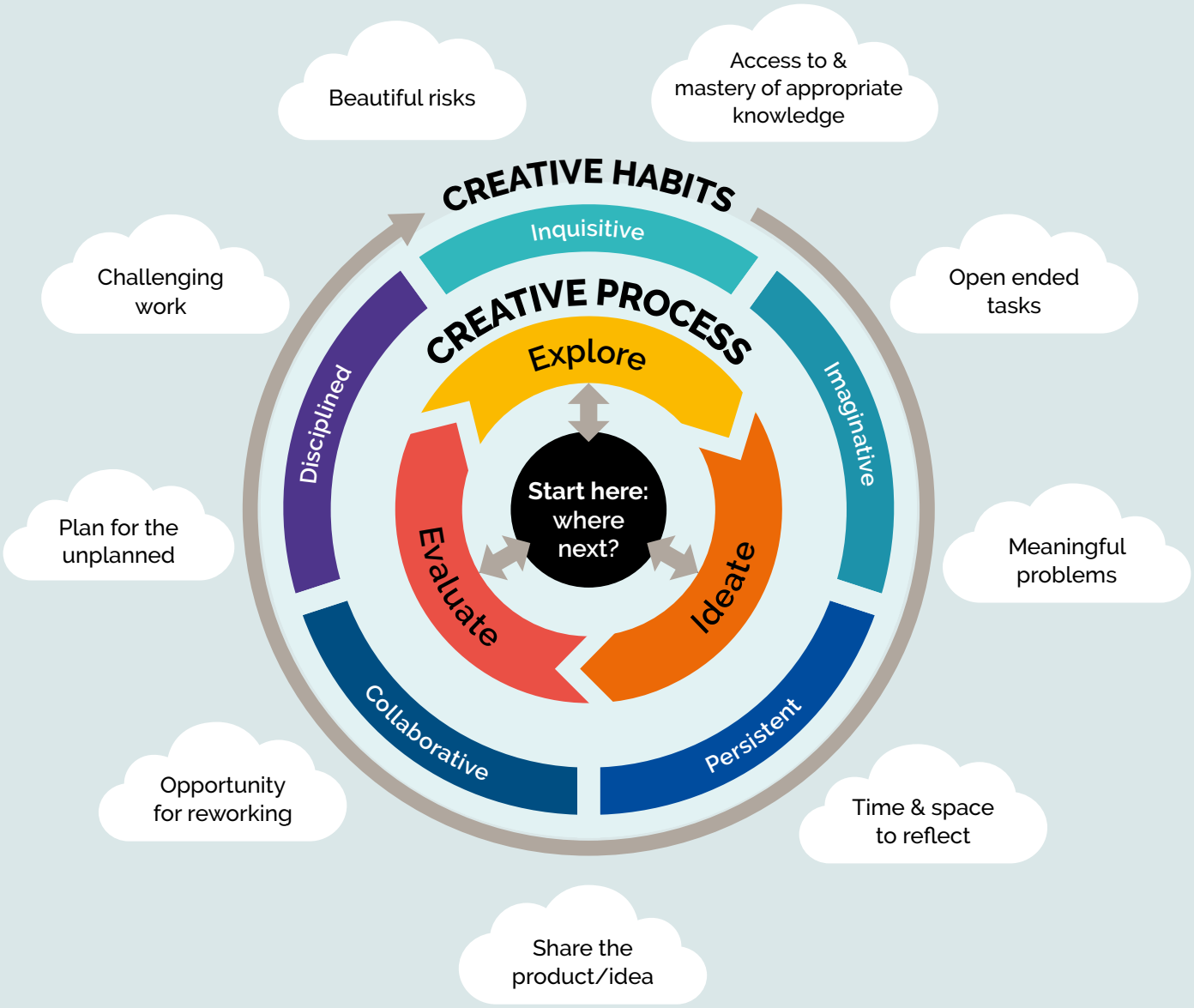
The final aspect of our Creativity Navigator focuses on the types of climate and task design that can support creativity to flourish in the classroom. For instance, tasks need to be personally meaningful, challenging, and open-ended, with children having some autonomy over aspect(s) of their learning. 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: Denyer-Green, G. (2025). Powerful Plants: A Case Example of Teaching for Creativity in Year 3 Science. Wellow Primary School. Winchester, UK: UWinAT Creativity Collaborative.

CREATIVITY NAVIGATOR



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KEY UNIT INFORMATION

Powerful Plants

INTENDED FOR:
Year 3

SUBJECT FOCUS:
Science

UNIT DURATION & FORMAT:
Unit of work (Plants) – Half term

LEARNING OBJECTIVES/OUTCOMES:

1. **National Curriculum – Science – Plants**
   - **a.** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
   - **b.** Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant
   - **c.** Investigate the way in which water is transported within plants
   - **d.** Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal
2. **Creative outcome:**
   To apply creative thinking processes to learn about, and experiment with, plants.

A scientific enquiry developed using the creative process of explore, ideate, evaluate to help achieve the National Curriculum objectives on Plants. This unit of work revisits the three-step process within each lesson focus to help allow and foster more creative thinking in Science. The unit is broken up into an explore session and three enquiry-led lessons. Previously, this unit relied on labelling pictures rather than physical exploration and testing.

By teaching this unit in a more practical way, it allowed for increased engagement across the whole class. This unit was also designed to remove as many learning barriers as possible, specifically writing barriers which led to greater participation from SEND pupils. Overall, the children's understanding and attainment within this whole unit was better with more children achieving the learning objectives.

STEPS FOR SUCCESS:

1. Allow time for the initial exploration stage of plants to allow children to identify the part and function.
2. Allow collaboration between children to aid discussion and share ideas during the ideate stage

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FULL UNIT DESCRIPTION

Powerful Plants

Introduction

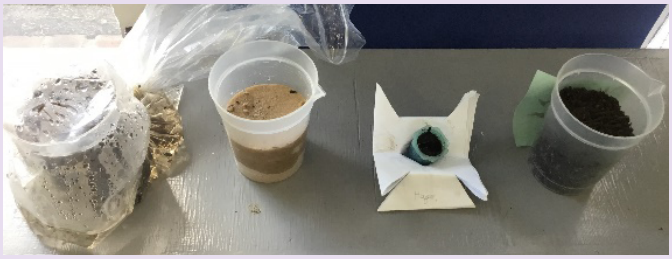
This unit of work was taught over one half term with four planned teaching sessions which cover all four National Curriculum statements for plants in LKS2.

Before I understood the creative process, this unit would have been delivered with very structured, adult-led experiments and would have usually had more structured worksheets to complete. This time, the unit was mostly taught practically, and the majority of recorded work was designed and created by the children, avoiding the need for pre-prepared, box-filling worksheets. Previously, worksheets were used in most lessons with adults modelling one way to complete the experiment which reduced creative thinking for the children. Some of the lessons would also have been taught with far less practical activities. For example, with plant dissection, it often became a labelling task which is more useful as a final assessment or retrieval task later on. Each lesson was previously taught to simply achieve the National Curriculum statement, however after looking at the unit with the creativity process in mind, each lesson was led with an enquiry question. This opened up the learning for the children to forge their own journey and allowed the opportunity to collaborate with others to work scientifically. By giving the children an enquiry question to follow, it allowed for rich, vocabulary-heavy discussions focused on not just answering the question but how they go about investigating the question to find a solution. Each lesson had a meaningful outcome which created more engagement as the children found they had a purpose for their learning.

The class had previously been made aware of the creative process and a couple of the habits of effective learners, as shown in the creativity navigator, in a prior learning unit. Previously, they had followed the creative process within DT, which naturally lends itself to the cycle of explore, ideate and evaluate. This was the first time the class had come across using this process outside of a "naturally creative" subject.

Lesson 1 – Explore session / Hook

The first lesson of this unit captivated the children with an exploratory workshop led by our local secondary school. During this session, the children were provided with various flowering plants to handle. Instead of using a labelling worksheet to learn the parts of the plant, the children were encouraged to explore the plants first. They were equipped with scientific tools such as scalpels, tweezers, petri dishes, and magnifying glasses to dissect the plants and identify as many different parts as possible. Once children had identified as many parts as possible, they were then given key scientific vocabulary to match to the parts of the flowers. By this point, children were already engaged with the learning and the movement of matching the physical part to the scientific vocabulary helped to embed this learning.



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Lesson 2 – Enquiry question: Do plants need all five requirements to grow?

Explore Stage

As a hook to capture the children's interest and curiosity, the children were given a problem.

"You are transported to an uninhabited planet – no-one has ever been here before. No-one has ever survived. What things would be important to take with you?"

This question sparked lots of interesting discussion as a class and allowed all children to participate. As a class, the children all agreed that oxygen, water, and food were needed. To link to our Science, the children were then asked what plants would need which led to a teaching input to ensure all children understood the five main resources plants need (water, oxygen, light, space and soil).

Ideate Stage

Once children knew the five things that plants need, the class were tasked with planning experiments to prove whether plants need all five requirements to grow. To do this, each group had to remove one of the five requirements (each group removed a different requirement) to prove whether it was needed.

Although the groups were told what they were removing and what they were keeping, they had to use their scientific knowledge to plan, prepare, and carry out their own investigations. The ideate stage of the creative process allowed for the children to use many of the creativity habits, such as being collaborative, persistent, disciplined, and inquisitive.

During this stage, adults did not guide children towards a specific way to carry out the experiment but created an atmosphere where children were inquisitive and shared different suggestions. Through careful adult questioning, we encouraged children to fully explain their ideas and thoughts behind them.

No worksheets were given for this lesson however each group decided to come up with their own way of recording their investigation plan and how they would collect their results. These experiments were then set up and left for 1 week to check and record results.

Evaluate Stage

This experiment was left for a period of one week. Over the course of the week, children were naturally evaluating their investigations on a daily basis by making visual observations. From their visual observations, children began to make predictions about the outcome of their investigation.

In addition to this, some groups quickly evaluated the effectiveness of their results collection method. For example, one group removed light from their plant and completely covered the plant and hid the pot in a dark space. On their plan, they drew a recording table for them to draw their plants progress however, they quickly realised if they uncovered the plant it would have access to light. This meant they would not be able to use their planned recording table so they evaluated the effectiveness of this and revisited the ideate stage to plan a new way of collecting results.

By the end of the week, children were making clear, scientific observations about the requirements for plants' growth.

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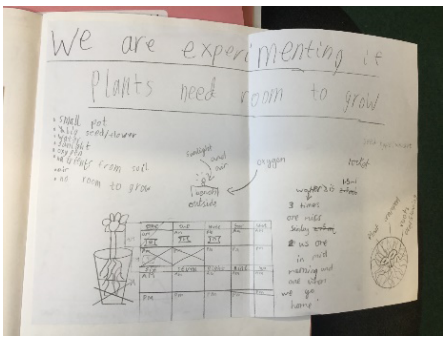

Lesson 3 – Enquiry Question – How would you teach pollination to another class?

Explore Stage

As a hook, children took part in a short activity where they modelled seed dispersal using a balloon and seeds. Through this activity, they learnt that seeds can be dispersed through 'explosion' as well as other methods. Moving on from here, children retrieved their prior learning about parts of a plant, to identify the parts needed for pollination. Children were explicitly taught how pollination works in this stage.

Ideate Stage

Using a video found online (which was aimed at younger children), I told the children that I could not find anything more suitable to show pollination. The children decided it was *too silly* and *baby-ish* for them so they were tasked with creating their own way of teaching pollination.

In groups, children had to use their own understanding of pollination to create a way of teaching pollination to another Year 3 class that would be more suitable. In groups, children came up with a range of ways to teach it. We had posters, informative leaflets, audio recordings of themselves explaining pollination whilst showing pictures and video recordings with figures. This was an effective way to see children's understanding as it was clear to see who could reteach it and who struggled. The task also lent itself to supporting SEND pupils as they could opt to show pollination through pictures or record themselves talking rather than through written means.

Evaluate Stage

To evaluate, the children swapped their outcomes with other groups to identify whether they had successfully captured the key parts of pollination.

Lesson 4 – Enquiry Question – Which experiment is the best at showing water transportation in plants?

Explore Stage

Rather than simply telling the children about how water is transported in plants, children were given true or false statements to discuss before having a go at answering them. These questions would then be revisited at the end of the lesson during the evaluation.

To give this lesson a meaningful outcome, the children were told they were going to help me teach this lesson next year by choosing the best experiment to show water transportation. Rather than the children carrying out lots of different experiments, the classroom was set up with three completed experiments for them to study. I chose for the children to study the end outcome as it would allow them to be inquisitive and disciplined by working out how the experiment worked. Using their understanding of water transportation, children moved round in groups to look at the experiment. They collaborated in groups to identify how the experiment worked, how it showed water transportation and evaluate how effective it was.

Evaluate Stage

Once the children had observed all the experiments, they had to select their favourite experiment and explain why it was the most useful. This allowed them to engage their understanding of working scientifically. This was a clear way to see their understanding of water transportation as they were able to explain how the experiment showed it. For some children, they chose to draw and write how the experiment was effective whilst others drew a diagram and recorded an audio explanation. After this, we completed a poll to show which of the three experiments the children found the most useful and effective at showing how plants transport water.

During this unit, the biggest challenge was time and ensuring enough time was planned for each stage. Although this unit was four lessons, it in fact took longer than that. It is really important to allow children plenty of time during each stage of the creative process. Within each lesson, each stage may take or need different lengths of time. For example, in lesson 2, I had allotted an entire afternoon for the planning and setting up of the experiment however the children had very meaningful discussions within their groups. This meant by the end of the allotted time, they had only just finished their plan and collected their items. Another difficulty was having all the resources available for this task.

By allowing the children to plan their own investigations following their ideas, it meant that not all resources were readily available. Going forwards, I would also teach the creative habit of discipline so they had to work within a set of parameters (e.g. what is readily available within school and the school grounds).

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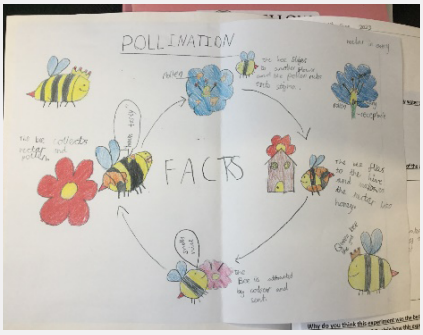
Impact on learning

By removing the need for worksheets and completely written evidence, it allowed for greater engagement across the class. It enabled all pupils to access the learning and answer the enquiry questions throughout the unit. Scientific vocabulary was taught and modelled consistently by adults in class, which was then used by children when explaining their ideas to each other.

By allowing children to work scientifically within groups and ideate their own plans, children were able to show a deeper level of understanding. They often showed innovative ways to get to the end goals that were completely different to other groups or to the ideas thought of by an adult. In addition to this, by presenting some of the enquiries from the perspective of teaching others, it allowed the children to present their learning in unique ways, often in ways that would have been beneficial to themselves.

Across the series of lessons, children were able to go through the creative process within each lesson and some were able to talk about what it means to explore or ideate. They were also able to practice and show the different creative habits such as collaboration, persistence, and discipline.



Supporting evidence of impact

Teachers and support staff were able to not only support but develop children's scientific learning through questioning. Support staff were able to move around the groups, observing the conversation and thought process behind their work before supporting where needed.

Children made comments about how they enjoyed being able to plan their experiments from the start and were able to have complete freedom of how to carry it out. *"It really challenged us to think about all of the little things we would need and to try to problem solve when it did not go well. My group did not plan the experiment in enough detail so when it came to watering the plant, we drowned it and the plant died. We had to restart and plan ours again."*

FINAL REFLECTIONS:

Before gaining a deeper understanding about the creative process, I mistakenly believed it was confined to subjects like art or design technology, where children produce a tangible creative outcome. However, creative thinking is a skill that can be taught, developed, and nurtured within all areas of the curriculum.

It is crucial that our curriculums and planning incorporate and promote these processes and habits throughout the educational experience. The creative process helps develop crucial skills enabling children to confidently apply these abilities to a wider range of challenges throughout life. As children's understanding of the creative process develops, they will naturally begin to use these skills within other subjects when encountering a problem. This will also allow children to show their understanding in a wider range of ways, allowing for children who have potential learning barriers in one subject to excel within another.

Ultimately, the creative process is a way to help foster a love for learning and ensures that education is accessible and engaging for all children.

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