

A Journey into Design Technology

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“Design is not just what it looks like and feels like. Design is how it works.”

Steve Jobs

Intent

The national Curriculum for DT:

‘Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others’ needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.’

National Curriculum 2013

Our Inquiry based, child-led topics, allow for context relevant learning, giving purposeful meaning and real-life relevance to learning in Design Technology. Our aim is to make the interconnectedness of our world explicit, to build a web of understanding about design, invention and human creativity, which encourages learner curiosity, questioning and reflection.

We aim to create design-thinking and promote a questioning approach to our man-made world through DT, encouraging children to pose their own questions and problem-solving strategies. Purposeful questions promote critical thought and deeper engagement with the concepts being learnt, skills being applied and independence in working, at a much more personal level. All learners are able to access DT learning at a level and in a way that is appropriate for them and highlights no sense of difference to others in the class, as all may be following similar yet different inquiries. Indeed, children with academic learning difficulties may find DT allows them to ‘shine’. Problem based learning within an inquiry approach promotes ‘ownership’ of the learning process, which is empowering for our young designers.

The whole school ethos of learning, which is based on inquiry and growth mindset, has given permission to children to have a go, make mistakes and try again. There may be no right or wrong answer, but the process is where the learning is.

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DT is an exciting area of learning that links to all other areas, when a problem solving, critical and creative approach is taken. The multi-disciplinary approach engendered by inquiry, draws on integrating different areas of learning that cross the boundaries of individual disciplines to enhance the scope and depth of learning. It can excite, inspire, and raise aspiration in our children of the possibilities open to them, and that their ideas can have an impact on others and their world.

Implementation

Throughout the school, practical skills are explicitly taught and modelled. Use of equipment and tools are taught, along with safe use. Skills develop sequentially and cumulatively to give the learners a firm foundation for learning and life beyond school.

Design content is interwoven with termly inquiries which ensures children will encounter the concepts in a multi-disciplinary way, and learning will be more relevant and part of a richer foundation of knowledge and skills, than would otherwise be the case. In this way, children are encouraged to think critically, ask questions and interrogate processes and outcomes. This also permits different ways of viewing, which has been promoted by Reggio Emilia ideas that our schools have focused on. Our Inquiry based learning allows learners to integrate new knowledge into larger concepts over time, so the foundation of their learning is strong and adaptable.



Hands on and practical learning is a keystone of classroom practice, as is collaborative work. Use of ICT for modelling, provocations and stimuli, problem based, experiential learning, enrichment, trips and visits, and use of the local environment enhance our engagement with Design Technology. The impact of this kind of



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learning embeds more readily, and children often talk about design projects, competitions and challenges from years before, which shows the impact achieved by this approach to learning.

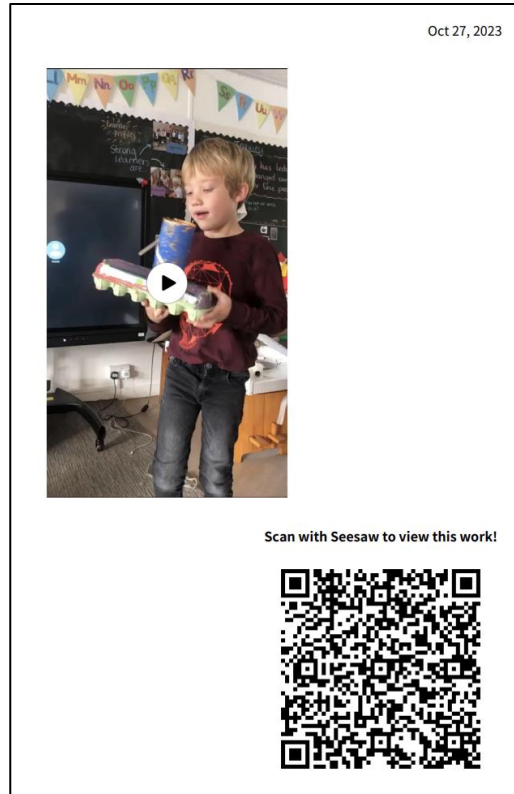
Children's skill base, application and thinking, are assessed to identify areas of strength and weakness. Support is offered through comments in books, conversations during learning time and questioning that allows scaffolded thought, learning and progression. Peer and group collaboration supports skill development.

Children with additional needs are encouraged to explore their ideas with support, and presentation of their learning, as with all children, may not be written. Whilst written recording is important, it is also important that this does not hamper them in their engagement or enjoyment or prevent them showing and sharing the design process or questions they have followed. Design Technology allows for learning and understanding in a way that is meaningful to each child, whilst adding to the class' collective learning ideas, concepts and connections, processes and questions.

DT at Boskenwyn and Germoe may look different in each class, but the common characteristics will be hands-on exploration, discussion, questioning, problem posing and solving, research, collaborative working, debate, sharing skills and presentation, trial and error, modelling and explanation, linking to previous learning, to different areas of experience and to the findings of others in the class. And of course, practical and proactive engagement in making. Our DT is experiential, and from the play-based discovery learning and schemas in Early years through to the more structured critical approach in Y6, the characteristics of good learning remain the same.

Sharing the learning is a key aspect of our inquiry-based approach and we invite our school community to celebrate our work. Here we invited parents to visit our exhibition of prototype inventions. We also share our work on Seesaw where children explain their thinking.

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Impact

- Children enjoy DT
- Develop social skills through collaborative sharing and working
- DT skills are demonstrated and discussed in presentation of work
- Evidence of DT skills in use across other areas of learning
- Encourages problem solving
- Supports individual creativity and artistic flare
- A practical area of learning that allows those with academic barriers to 'shine' and grow in confidence
- Ensures development of awareness of safety, appropriate use of tools and equipment relating to life skills
- Good engagement with ideas, process and outcomes

Pupil Voice

Some comments made by our children:

'Very fun. I really liked the video about the popcorn machine – it helped me think about my own design'
(Y6)

'I really like it because you can be really creative – even though you have instructions, you can go off and make what you want.'
(Y6)

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'I made a design using electricity – that speaks or spins. I made a face – it's eyes lit up.' (Y3)

" I like design. If you get something wrong, you can always rebuild it." (Y2)

"I like it because you can have fun with it. I like the part that I had to change my design. I couldn't make the bed because I couldn't make the giant stand and ladder - I just changed my vehicle so it was remote control" (Y1)



"I liked drawing and building the bridge. It was really tricky" (Y2)

"I liked making the bridge. It was actually strong enough that I can sit on it" (Y2)

"I like making stuff. It was hard making the prototypes because it was hard actually making things work. I learnt how to make stuff and keep on trying" (Y2)

The Year 5/6 teacher told me that this week she explained the upcoming DT project to her class, and when they heard that they would be showing their work in an exhibition to the school community they all cheered.

An Example Progression of Skills

Design, Make, Evaluate and Improve		<ul style="list-style-type: none"> • Design products that have a clear purpose and an 	<ul style="list-style-type: none"> • Design with purpose by identifying opportunities to 	<ul style="list-style-type: none"> • Design with the user in mind, motivated by the service a product will
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		<p>intended user.</p> <ul style="list-style-type: none"> • Make products, refining the design as work progresses. • Use software to design. 	<p>design.</p> <ul style="list-style-type: none"> • Make products by working efficiently (such as by carefully selecting materials). • Refine work and techniques as work progresses, continually evaluating the product design. • Use software to design and represent product designs. 	<p>offer (rather than simply for profit).</p> <ul style="list-style-type: none"> • Make products through stages of prototypes, making continual refinements. • Ensure products have a high quality finish, using art skills where appropriate. • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.
	<p>What might this look like?</p>	<p>Engage in the design process to identify a real-life problem and design a solution. Create a prototype and share it with an audience.</p>	<p>Engage in the design process to identify a real-life problem and design a solution. Create a prototype and share it with an audience.</p>	<p>Engage in the design process to identify a real-life problem and design a solution. Create a prototype and share it with an audience.</p>

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Examples of Learning Outcomes

- Designing, building and racing a green power go-kart
- Designing, building floating boats
- Making a robot for the Mazey Day parade.
- Using Design Thinking to create prototypes that solve real problems

LEARNER PROFILE

Providing a curriculum rich in Inquiry based learning allows our children to nurture their talents and passions and take control of their learning. They are driven by both their own curiosity and hunger for learning and their teacher's ability to provoke their interest by using stimulating resources and artefacts. We intend for our learners to be:

Open-minded: Appreciate their own and others' cultures, history, values and traditions and be willing to grow from their experiences.



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Thinkers: Approach cross-curricular tasks by thinking logically, creatively and critically and able to adapt thinking as they learn through reflection. Make reasoned and ethical decisions as a result.

Inquirers: Learn independently and with others, nurturing curiosity and developing skills for inquiry and research. Foster enthusiasm and sustaining a love of learning throughout life.

Caring: Have empathy and show compassion and respect. Make a positive difference in the lives of others and in the world around them.

Communicators: Communicate ideas confidently and creatively in different ways for different purposes (confident, responsive, respectful) listen carefully to different perspectives.

Risk-takers: Approach uncertainty with forethought and determination, exploring new ideas and innovative strategies. Be resourceful and resilient in the face of challenges and change.

Knowledgeable: Explore knowledge across a range of disciplines. Engage with local and global issues and ideas.

Balanced: Recognise the interdependence with other people and the world we live in. Understand the importance of balancing our lives – intellectual, physical and emotional – to achieve well-being.

Reflective: Have thoughtful consideration of the world and our own ideas and experiences. Understand our strengths and weaknesses to support our learning and personal development.

Principled: Act with integrity and honesty, having a strong sense of fairness and justice. Respect rights and take responsibility for our actions and their consequences.

Cultural Capital

Cultural capital is about preparing pupils with the essential knowledge and skills for what comes next. The exploration of new skills and experiences helps to nurture resilience, curiosity and creativity. Through this journey pupils develop new forms of cultural capital that makes a difference in individual mind-sets, which consequently shapes their future.

Cultural capital is the accumulation of knowledge, behaviours, and skills that a child can draw upon and which demonstrates their cultural awareness, knowledge and competence; it is one of the key ingredients a child will draw upon to be successful in society, their career and the world of work.

Cultural capital promotes social mobility and success.

Cultural capital gives a child power. It helps them achieve goals, become successful, and rise up the social ladder without necessarily having wealth or financial capital.

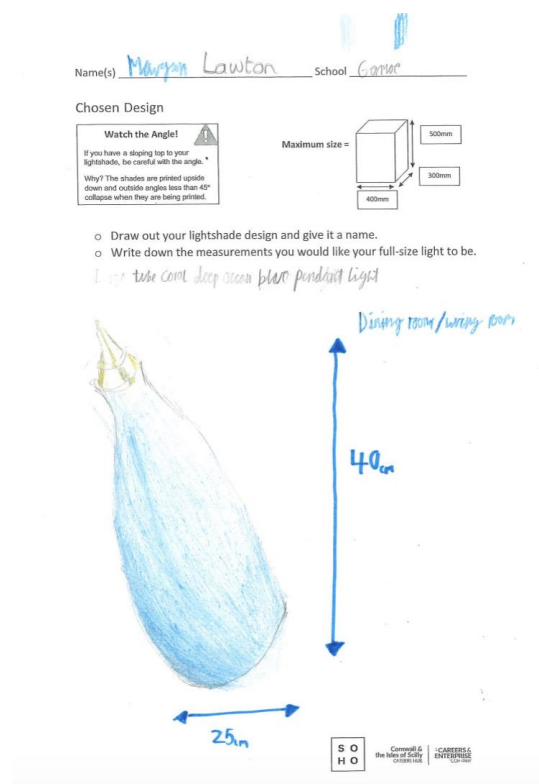
Cultural capital is having assets that give children the desire to aspire and achieve social mobility whatever their starting point.

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Examples of cultural capital within our Design Technology curriculum:

Design Technology gives an opportunity to develop children’s cultural awareness and understanding. It allows experience to be gained of the interconnectedness of people, places, ideas, innovation, application and adaptation in design processes and outcomes. Some examples of DT in action are:

- Each year the Year 5 and 6 students take part in the Goblin Greenpower Racing Challenge, which involves building a go-kart and racing it at a full day competition. The children organise themselves into sub-committees and take ownership of various aspects of the process. The whole class see themselves as a team and often return to school with a trophy.
- Kindergarten’s rolling snack gave the children the chance to make and eat food daily. They are involved in preparing snacks for the group, chopping, peeling and slicing fruit, spreading houmous, jam and butter.
- Years 5 and 6 designed and made boats. They tested the boats in a paddling pool at school then and raced them at the river. Reception designed and made boats using recycling materials.
- The Year 5 and 6 children took part in the SOHO challenge where they used recycled materials to design and prototype lights.



Our Multi-Disciplinary Approach

The Federation of Boskenwyn and Germoe Schools believe in supporting children to become independent learners, who are driven by their own sense of wonder and inquisitiveness. To this end, we promote an

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Inquiry led, topic-based approach. This encourages child-led learning, whilst supporting and scaffolding progressive skill development.

Inquiry based learning makes links between concepts and ideas, skills and application, across many areas of learning. It promotes a creative and broad foundation which children are more readily able to use and apply, adapt and develop.

Much DT learning is couched within a problem or need, and the Design process sits neatly with the journey children take in Inquiry learning. As with all inquiry-based learning, questioning at a deep level, encourages interrogation of process and concepts and children become thinkers, invested in their own learning. DT within our Inquiry ethos promotes independent and reflective learners, who can assimilate different skills, concepts and understanding to take their learning further, using their own curiosity and creativity.



We use the Design Thinking process as it aligns with an inquiry mindset.

Priorities for this Year

- Develop assessment protocols for Design Technology using the newly acquired INSIGHT tracking system.
- Coordinate planning documents on Teams so that both schools are aligned.
- Read and research more examples of Design Thinking, Hackathons, Project Based Learning and share with staff (either at a Twilight session or as handouts)
- Develop lessons that have support to meet the needs of all pupils, particularly those with SEND.
- Develop a programme for lesson observations and sharing good practice.
- Continue monitoring the implementation of progressive DT learning in new rolling programme.
- Audit the resources at both schools and develop a catalogue for teachers.
- Application for STEM funding
- Make learning more visible on website and social media.
- Embed STEM and STEAM via outside opportunities, and through multi-disciplinary topic-based approach