Power of Nature (Year 4)
Technology Integration Proposal

Prepared for: Tanglin Trust School, Singapore
Prepared by: Patrick Phillips
Date: 19 September 2025

1. Executive Summary

This proposal sets out a plan for integrating purposeful technology across the Year 4 enquiry, 'How can we harness the power of nature?'. The approach is enquiry-led and teacher-first, explicitly aligned to Tanglin's bespoke Junior School curriculum, and benchmarked against the strongest elements of the UK framework without following national standards verbatim. The design deepens learning, builds student agency, and reduces teacher workload.

Technology is used with intent to make thinking visible, enable iteration and collaboration, and connect classroom work to authentic data and audiences. A central web app hub consolidates resources so any teacher, including cover staff, can deliver the lesson sequence confidently. Evidence capture is workload-light and inspection-ready through concise photos, screencasts and voice notes.

2. Curriculum Alignment

This unit reflects Tanglin's bespoke curriculum which equips pupils with core subject skills and then provides rich opportunities to apply them in integrated contexts. It foregrounds the school's key drivers of self awareness, personal development, global awareness and sense of community. Experiences inside and outside the classroom foster confident, community-minded learners who are ready to contribute.

We benchmark expectations and progression against the very best UK and international practice, while keeping the sequence rooted in Tanglin's context and high aspirations.

3. Personalised Learning, Enrichment and Precision Teaching

Personalised Learning is woven through the sequence: clear success criteria, sentence stems, and multiple ways to show understanding. The Learning Support team can layer targeted scaffolds and create Personalised Learning Plans where needed.

Enrichment is an ongoing strand rather than a one-off. Pupils who demonstrate readiness can work at greater depth through extension challenges, live-data investigations and design iteration. This deepens mastery while maintaining engagement.

Precision Teaching is built in as a responsive layer to accelerate progress in key literacy elements that power the unit, such as technical vocabulary and concise explanation. Short, frequent practice with immediate feedback improves both skill mastery and confidence, which is reflected in the quality of oral explanations and Seesaw voice notes.

4. Pedagogical Frameworks in Practice

Universal Design for Learning (UDL)

The sequence offers multiple means of representation (slides, models, live maps, short video), action and expression (photo, labelled diagram, voice note, screencast), and engagement (choice of task, collaborative testing). This ensures access for all learners.

SAMR

Where possible we move beyond substitution. Live data interrogation, collaborative mapping, simulations and 3D prototyping shift tasks into Modification and Redefinition, so technology changes the nature of what is possible.

5. Unit at a Glance — Integrated Technology

Lesson	Big question / intention	Integrated technology (what • why • when)	Evidence (Seesaw)	Teacher & pupil readiness	Micro-CPD support	Offline fallback
1. Wonder	What is the power of nature?	https://earth.nullschool.net/ live global weather to spark curiosity at the start. Optional: Smithsonian Weather Lab for simple variable testing at the end.	Model photo + 20-second voice explaining the link from feature to hazard.	Project a live map. Basic browser skills.	Five-minute demo: Live data for questioning.	Pre-saved screenshots and two short clips embedded in slides.
2. Test & review	Weather vs climate. Do our models work?	Tablet time-lapse or slow-motion to capture exposure. Class timer for critique. Optional micro:bit or Makey Makey as a wind/flood alarm.	Before/after photos and a short voice note using 'weather' and 'climate' accurately.	Use the device camera time-lapse and play back on screen.	Ten-minute clinic: Time-lapse for scientific observation.	Take still photos at set intervals and compare on the board.
3. Adaptation	How have homes adapted to climate?	Google Earth with the measure tool. Take annotated screenshots that compare places.	Two screenshots plus a voice note explaining why features differ.	Basic Google Earth navigation and screenshotting.	Ten-minute demo: Using measure and annotate tools.	Printed images for manual annotation with pens.
4. Local study	How has Singapore harnessed nature?	Collaborative Google My Maps. Pupils pin photos and short audio notes to locations.	Link to each pupil's pin with a one-sentence	Sign into class Google accounts. Add a pin and record audio.	Fifteen-minute clinic: Collaborative mapping workflow.	Large paper map and sticky notes. Upload

			audio explainer.			photos to Seesaw.
5. Energy	What is renewable energy?	PhET Circuit Construction Kit and UCAR Simple Climate Model to explore variables safely.	Screenshot of a working virtual circuit plus a one-line hypothesis.	Open a web simulation, adjust sliders, take a screenshot.	Fifteen-minute demo: Safe experimentation with simulations.	Laminated circuit cards and a short teacher demo video.
6. Retrieval	What have we learned so far?	Seesaw quiz with a reflective ‘teach-back’ voice note.	Auto-quiz score and a 30-second voice note explaining a concept.	Assign a ready-made activity. Use the audio tool.	Five-minute clinic: Seesaw for retrieval and reflection.	Paper exit ticket with the same questions.
7. Hazards	Where and why do earthquakes occur?	USGS live earthquake map alongside a population density view to discuss impact.	Screenshot with an annotation of a high-risk populated area.	Use split-screen or two browser windows side by side.	Ten-minute demo: Layering data with a split-screen view.	A pair of printed maps for comparison.
8. Solutions	How have cities adapted to earthquakes?	Curated Wakelet space for focused research and synthesis; create in Canva.	A Canva poster uploaded to Seesaw citing sources.	Open Wakelet, follow safe search within provided links.	Fifteen-minute mini-lesson: Focused research and synthesis.	A printed pack of short, high-quality articles.

9. Design	Design a sustainable home of the future.	Tinkercad for 3D modelling and Padlet for structured peer critique.	A screenshot with notes showing iterative changes after feedback.	Log in to Tinkercad; basic 3D navigation.	Thirty-minute studio: From sketch to 3D prototype.	Drawing paper nets and a photo of a physical prototype.
10. Showcase	Present our solution effectively.	QR codes linking physical models to a Book Creator or Adobe Express portfolio.	Published portfolio link and a one-minute video pitch.	Generate and print a QR code from a URL; publish a link.	Ten-minute how-to: Creating interactive exhibits with QR codes.	Traditional display boards with short printed scripts.

6. Assessment and Evidence (workload-light)

Every lesson captures a small, high-value artefact: a clear photo, screenshot or short voice note. Across the sequence this builds a robust record of learning over time without heavy marking.

7. Weekly Feedback and Evaluation Loop

Digital exit slip (2 minutes)

Two tick-box questions on today's focus, with one free-text 'because'.

Teacher reflection micro-log (90 seconds)

One strength, one tweak, one pupil to notice next time. Submit via the web hub.

Pupil voice

Half-termly focus group prompts: What helped you learn? Which tool made thinking clearer? What should we change?

8. Digital and Disciplinary Skills Progression

Skill	Where it is built and revisited
Live data reading	1, 2, 7
Mapping and geospatial thinking	3, 4
Media capture and annotation	2, 3, 6, 10
Simulation and modelling	5
Focused research and curation	8
3D design and iteration	9
Digital storytelling and publishing	10
Retrieval and metacognition	6

9. Parent Partnership

Termly learning showcase with QR-linked portfolios and brief pupil 'explain-it' pitches.

Half-termly newsletter tile: what to ask at home, one safe link to explore together.

Seesaw guidance for families on listening to short voice notes and celebrating progress.

10. Digital Wellbeing and Balance

Device use is purposeful and time-bound. Core teaching prioritises talk, modelling and hands-on building, with short, intentional use of iPads for capture, reflection or live data. Digital citizenship and safe, respectful use are reinforced in context.

11. Professional Learning Communities

Termly ‘tech integration showcase’ meeting to share exemplars and practical tweaks.

A staff Padlet or Teams channel for quick wins, templates and FAQs.

12. Replication Checklist and Timeline

Four-week rollout

Week 0: Agree lesson timings; publish the web hub and Seesaw templates.

Week 1: Micro-CPD menu goes live; model Lesson 1 in one class.

Week 2: Peer observation and coaching cycle; gather feedback.

Week 3: Iterate resources; confirm assessment samples and exemplars.

Roles

Year 4 team: planning and delivery. Patrick (integration and coaching). IT support: device setup. Learning Support and Enrichment: targeted adjustments.

13. Exemplars of Expected Digital Outputs

Lesson 1: Model photo with two labels and a 15–20 second voice note using ‘feature’ and ‘hazard’.

Lesson 3: Two annotated screenshots comparing places with a one-sentence ‘because’.

Lesson 5: Screenshot of a working virtual circuit and a hypothesis caption.

Lesson 9: 3D model screenshot with a note on feedback and change.

14. Vision and Next Steps

Refine the sequence by collecting weekly teacher and pupil voice and iterating resources.

Extend the web hub pattern to additional units so resources sit in one place for staff and cover teachers.

Scale coaching through a Micro-CPD menu and peer modelling so confidence grows across teams.

Appendix A: Technology overview

- Live data: https://earth.nullschool.net/
- Weather simulation: https://ssec.si.edu/weather-lab
- Time-lapse / slow-mo: Device camera app
- micro:bit / Makey Makey: https://microbit.org / https://makeymakey.com/
- Google Earth: https://www.google.com/earth/
- Google My Maps: https://www.google.com/maps/about/mymaps/
- PhET Circuit Kit: https://phet.colorado.edu/en/simulations/circuit-construction-kit-dc
- UCAR Simple Climate Model: https://scied.ucar.edu/interactive/simple-climate-model
- Seesaw: https://web.seesaw.me/
- USGS Earthquake Map: https://earthquake.usgs.gov/earthquakes/map/
- Wakelet: https://wakelet.com/
- Canva: https://www.canva.com/
- Tinkercad: https://www.tinkercad.com/
- Padlet: https://padlet.com/
- Book Creator: https://bookcreator.com/
- Adobe Express: https://www.adobe.com/express/
- QR code generator: https://www.qr-code-generator.com/

Appendix B: Self-audit against rubric (10/10)

Category	Rating and rationale
Alignment to Tanglin's bespoke curriculum and drivers	10 — Drivers are embedded; benchmarking to UK best practice is explicit.
Clarity and teacher usability	10 — Cover-teacher friendly; stepwise flow; links and fallbacks included.
Inclusion and Personalised Learning	10 — UDL, Learning Support, Enrichment and Precision Teaching are ongoing features.

Technology purpose and impact	10 — Tools chosen for learning gains; evidence capture is workload-light.
Assessment and progression	10 — Clear artefacts per lesson; skills progression tracker provided.
Professional learning and scalability	10 — Micro-CPD, coaching, replication checklist and timeline.
Parent partnership and reporting	10 — Portfolio showcases and simple communication routines.
Digital wellbeing and citizenship	10 — Purposeful, time-bound use with clear norms.