NSW Department of Education

Engineering Design Process

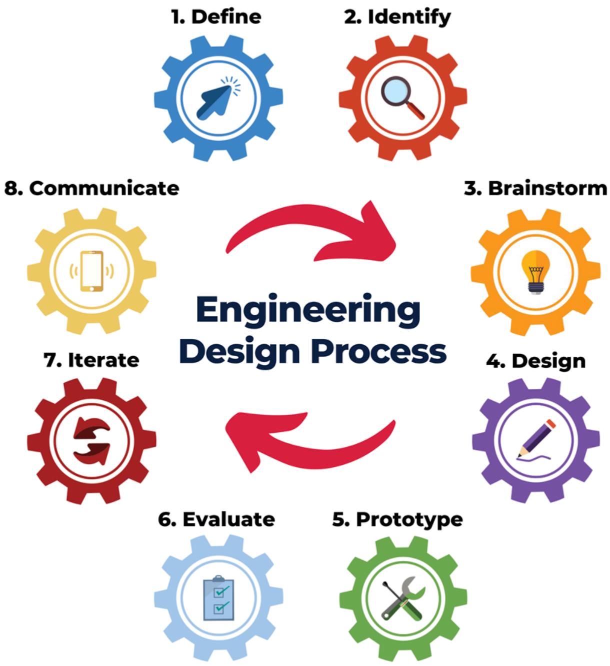
A comprehensive teacher guide

Using the Engineering Design Process in STEM

About this resource

This resource introduces the Engineering Design Process (EDP), a practical framework that supports students to think like engineers. It explains how to use the EDP in STEM classrooms and provides purposeful teaching strategies, key questioning techniques and ready-to-use activities that embed explicit teaching at each step of the process.

Whether you are designing a new unit, mapping and integrating syllabus content, delivering a classroom activity, or embedding STEM into your program, the EDP offers a shared language and consistent approach to developing foundational STEM capabilities. It supports problem-solving, creativity, critical thinking, collaboration and ongoing reflection through iteration.



Contents

Engineering Design Process

The Engineering Design Process (EDP) helps students think like engineers. Developed with input from teachers and industry experts, it provides a clear, consistent framework for examining problems, generating ideas and building solutions. The EDP offers a shared language across all stages of schooling, supporting a cohesive and continuous learning journey.

Teaching and learning sample units embed the EDP across STEM activities. These units are supported by classroom resources that help students engage with each step, including digital and downloadable materials such as:

- design folio
- posters for classroom displays
- tabletop cards to support group work
- lanyard cards for students to support learning during activities

Each phase in the EDP is represented by a colourful cog icon, making the process easy to follow (Figure 1). It is not necessary to use all eight EDP steps (cogs) in every design activity and the steps are not intended to follow a fixed, linear sequence. The cogs can be used in different orders depending on the specific problem and some, such as iterate, may be revisited multiple times within a single task.

The EDP provides a flexible scaffold to support students in solving open-ended, authentic problems, such as those found in design briefs or project-based learning. Each design journey will be unique, with students drawing on different cogs at different times, depending on the nature of the challenge.

This teacher guide includes sample key questions and suggested activities for each step of the process. These examples are designed to support teachers in developing students' problem-solving skills and guiding their learning through each phase of the design process.

Figure 1 – The Engineering Design Process

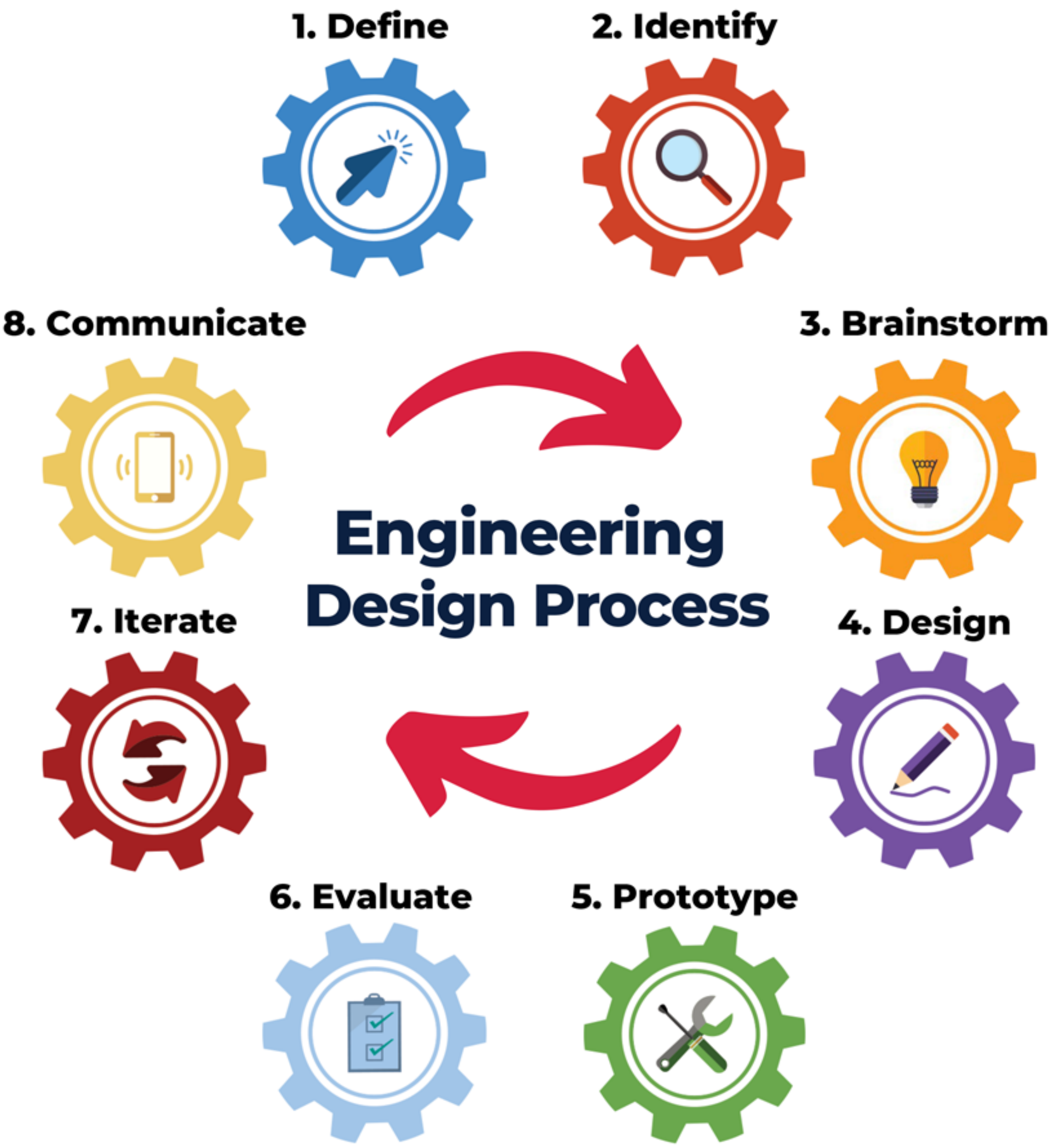
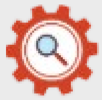
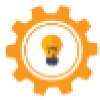
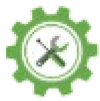
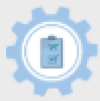
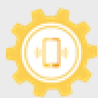


Table 1 — Engineering Design Process overview and icons

Process	Icon
1 Define – clarify the driving question or problem	
2 Identify – think, ask questions, research and plan	
3 Brainstorm – encourage curiosity and generate ideas	
4 Design – draw and communicate potential solutions	
5 Prototype – produce a model or early version of possible solutions	
6 Evaluate – test your design and share what you found	
7 Iterate – reflect and improve your solution	
8 Communicate – share your ideas with others	

Guide to the Engineering Design Process

The following pages provide a guide for teachers, including sample ‘key questions’ and ‘possible activities’ that students might complete at each step of the EDP. To support students to engage meaningfully with these questions, teachers should plan for the intentional introduction of new vocabulary, language features and thinking structures as part of their learning. This includes using clear explanations, worked examples and modelling to build student understanding. A glossary of terms is included to support teachers in explicitly introducing and reinforcing key vocabulary related to each step of the process, ensuring consistency across all grades.

It is important to consider the language, literacy and cultural demands of each activity and to provide appropriate support for all students, including EAL/D learners (English as an Additional Language or Dialect) and those requiring additional learning or access adjustments.

This is not an exhaustive list but is intended to spark ideas and offer direction for teachers and students.

The EDP provides a scaffold to help students solve authentic STEM problems. While each engineering journey is unique, the steps outlined offer a structured approach to working through challenges and developing solutions. Students' learning experiences will vary depending on the type of problem they are solving. This guide offers examples to support the development of students’ problem-solving skills across different contexts. When planning learning activities, aim to make them inclusive from the outset and provide specific adjustments where needed to support equitable and active participation alongside peers.

Note: For additional support, the Jiggler challenge videos provide a valuable resource designed for secondary students. While some content may be advanced, many parts can be adapted with teacher guidance for Stage 3 or more capable students. Primarily, these videos and resource offer teachers information about vocabulary and strategies to use during engineering design tasks in the classroom. They demonstrate how to explicitly embed the Engineering Design Process at each step, using clear explanations, practical strategies, drawings, modelled learning and think-alouds to support student understanding and engagement.

Define – clarify the driving question or problem

Key questions

- What is the driving question asking you to do?
- What do the key words in the driving question mean?
- What information do you already have and what do you still need to find out?
- Who has been affected by the driving question or problem?
- What would happen if this problem was not solved?
- What do you think they need? What other questions do you have?
- Why does the problem need to be solved? What steps will need to occur to solve the problem?
- Does this problem remind you of something that's happened to you?
- What are your initial thoughts on how you could solve the problem?
- How can you or your team contribute to finding the best solution?
- Who else is concerned by the problem?
- How will you know that your solution will meet their needs?
- How can you combine what you know and what you can do to understand and solve this problem?

Possible activities

Discuss and co-develop clear, relevant learning intentions and success criteria. Revisit and update as the project progresses.

Define the driving question with a clear statement and identify key parts of the problem. Agree on what a successful solution should look like, feel like and do. Support students to record criteria using a graphic organiser that aligns with the learning intentions.

Develop a mind map or 'sticky note' display to show ideas, initial thoughts, definitions and questions. Model 'think-alouds', such as, 'I wonder what's the same and what's different between these suggestions?' Assist students to cluster similar ideas, questions and definitions. As a class, discuss key points related to the driving question and rearrange the sticky notes to find connections between the problem, prior knowledge and new questions.

Create individual idea maps using digital devices to share prior knowledge. In groups, students combine ideas into one mind map with shared thoughts, questions and definitions. Each group presents, with the teacher scaffolding connections and common ideas. As a class, create one shared mind map that combines all ideas, definitions and questions.

Guide a class carousel where students rotate in small groups around butcher paper stations featuring word or drawing prompts related to the problem or driving question. At each station, students record ideas, questions and possible solutions using words, drawings, or diagrams. After the carousel, check for understanding with a gallery walk to review and discuss the shared ideas. As a class, develop a plan to respond to the design brief by connecting key ideas from each station

Construct a 'living list' of perspectives and resources by displaying blank paper on a wall where students can add ideas throughout the day. Start by asking them to draw or write the materials needed and who is impacted by the driving question. Encourage empathy by considering different perspectives, people, living things, the environment, or other stakeholders. As the day goes on, students can add suggestions or reflections. The list evolves over time and acts as a visual reminder of collective, empathy-driven thinking. At the end of the day, review the list together and discuss how it supports problem-solving.

Identify – think, ask questions, research and plan

Key questions

- What are the limitations of the problem? How do you know what is possible?
- Why is it important to solve this problem? Who will your solution help?
- What solutions have you seen before for similar problems and how might those ideas help you to make decisions about your own solutions?
- What skills and knowledge do you or your team have that can help you find a solution?
- What skills and knowledge do you still need to learn or find out?
- What questions do you need to research to better understand the problem and possible solutions?
- How much time do you need to complete the project?
- Are there any rules, safety concerns, or requirements you need to follow?
- What tools and equipment do you need and how do you know they are the most useful for your solution?
- What do you need to consider to make sure the solution works well for everyone?
- How will you know if your solution works, for example, is comfortable or easy to use?
- What tools, materials or technologies could help you solve this problem differently?
- Can you combine ideas or try a new approach to be more creative?

Possible activities

Identify skills and knowledge by guiding students to create a visual display, such as a KWL (Know – Want to Know – Learned) chart. Students research and record key facts, constraints and stakeholder need using journals, drawings or diagrams. In groups, each student investigates a different aspect of the problem and shares findings to build understanding. Teachers respond by addressing misconceptions, prompting questions and guiding reflection.

Determine the key facts and data needed before starting the project to ensure the problem and solution consider constraints, possibilities and stakeholder needs. Break the task into manageable chunks, such as what we know (document prior factual knowledge), what we need to find out (generate questions or areas for investigation) and how can we find out? (plan ways to gather data from sources, people, or observations).

Collaboratively, create a 'fact file' using diagrams, drawings or symbols. Each student research a specific aspect (for example, environment, materials, safety, needs), then shares findings with the group. This reduces cognitive load, encourages collaboration and focuses on key facts. Use graphic organisers, anchor charts, or checklists to organise learning.

Analyse the mind maps. Using a student design folio or digital device, evaluate ideas, questions and definitions, discussing which help or limit solutions and how to overcome obstacles.

Discuss ways people have solved similar problems. Using a learning portfolio, create a visual diary of what worked and what did not work. To deepen understanding, use a Frayer Diagram to explore key concepts that emerged, such as innovation, functionality, or sustainability. Reflect on how these insights might guide solving the current problem.

Reflect on the 'identify' cog. Students complete an exit ticket by writing or drawing one possibility that could help solve the problem and one limitation that might make it difficult.

Establish a project timeline with key milestones and display it for students to review as they progress through the project.

Demonstrate how to create a visual representation of ideas, considering appearance, function and user experience. Use mini whiteboards to list the limitations and possibilities based on the available resources and timeframe. Discuss how to use resources efficiently, reduce waste and share materials to support sustainable design choices.

Brainstorm – encourage curiosity and generate ideas

Key questions

- How can you come up with ideas on your own, or in collaboration with a team?
- What do you already know or have that can help you to share ideas?
- Can you explain why this idea is better than others?
- What do you need to think about? What questions do you need to ask along the way?
- What strategies can you use to choose the best ideas? How can you build on someone else's idea?
- How can you make sure that your ideas are on the right track?
- How can you build a shared idea from everyone's thinking?
- If you're in a team, how can you make sure that everyone's ideas are heard?
- What can you do if you do not agree on an idea?
- Is there another way to look at the problem that no one has thought of yet?
- What can you do that's new or different? How will you know that your solution is innovative?
- What is the best way to communicate your ideas to others?
- How can you mix or combine ideas to make something even better?

Possible activities

Encourage imagination and divergent thinking by having students independently record as many creative ideas as possible within a set time. Seat students in a circle and model sharing an idea with clear, creative vocabulary. Invite one student to share an idea aloud and the next builds on it. Continue around the circle to promote idea expansion and quick thinking.

Model how to generate ideas using drawings, research, discussion and materials. Guide students through a task with these strategies, then support them to represent their ideas in different ways.

Support students to think creatively and critically by recording three ‘what if’ questions individually or in groups, like ‘What if the person doesn’t like it?’ or ‘What if it needs to be waterproof?’

Display unusual products or images around the room. In groups, students rotate as 'innovation experts,' brainstorming ways to improve each. Encourage them to consider tools, skills, or technologies. Record ideas on an anchor chart or digital board.

Guide students to organise their main ideas using an activity grid or learning folio. Invite them to choose the format that best suits how they think and express ideas. During the activity, use hinge questions to check understanding and guide students toward the next steps in their design process.

Construct thumbnail sketches and simple drawings of initial ideas in their learning folio, exploring how they work and what materials or technologies are needed. Use ‘What if…?’ or ‘How might we…?’ questions to inspire curiosity and creativity. Support students to note unusual features or interesting components to share with the class.

Facilitate idea sharing in pairs or teams. Support students to listen actively and build on others’ thinking. Encourage the use of ‘why’ or ‘tell me more’ questions to deepen understanding and develop ideas.

Initiate a ‘Question Storm’ where students rapidly generate as many questions as possible about the problem within a time limit. Encourage ‘why,’ ‘what if,’ and ‘how’ questions to deepen curiosity. Guide students to group similar questions and select the most interesting to investigate further.

Lead students to identify possible challenges in their design and brainstorm alternatives. In groups, students use digital apps or their learning folio to record and share their ideas. Encourage them to collaborate by commenting and building on each other's thoughts, fostering creative and critical exploration of the problem.

Design – draw and communicate potential solutions

Key questions

- How does your idea help to answer the driving question?
- Who is the design for and how will it help them?
- How will creating a detailed drawing and plan help you choose the best solution for your design, including the materials you will use?
- Who can you ask, or what can you find out, to help you make the best solution and choose the best materials?
- What feedback from others about your ideas have helped shape your design?
- What steps will you follow? What will you need to do first, next and last?
- How will you use time, materials and your working space efficiently?
- What materials best match for your design idea and why?
- How can you test different ideas and materials to see what works best and how will you know they are the right choice?
- What part of the design might be the hardest to create and how will you plan for that?
- What skills and strategies do you need to create the best design solution and choose the right materials? What are you thinking about when selecting the materials for your design?
- Do you have all the tools, equipment and materials you need to complete your design? Are there any other resources you might need? Are there ways to make the most of what's available?
- What risks or safety issues have you considered in your design?

Possible activities

Review ideas from the 'Define', 'Identify' and 'Brainstorm' phases. Use an 'entry ticket' task for students to select one promising idea to investigate, noting any limitations or challenges.

Create annotated drawings in their learning folio (paper or digital) showing how each part of the design solves the problem. Use a matrix to highlight chosen materials and explain the reasons for these selections. Apply convergent thinking to refine ideas and material choices.

Model sequence steps using an 'if-then' approach. Show a common product (handmade or store-bought) and ask students to identify key parts. Encourage them to think about assembly order by posing questions like, 'if I add this part first, what happens next?' and 'how do I secure this part to ensure everything fits together correctly?' Guide students to consider how the parts work together, what's working well and how changing the sequence might affect the final design. Use a Plus, Minus, Interesting (PMI) chart to reflect on their design ladder or layered blocks template, testing and adjusting the order for a logical design flow from one step to the next.

Connect to prior learning by brainstorming questions and suggesting 'experts' to interview to test ideas. Experts might include a teacher, community guest or a short video.

Provide a range of tools to help students communicate ideas, such as drawing, graphic organisers or digital tools

Demonstrate critical thinking, problem solving and entrepreneurial thinking by making your reasoning visible. Show how or act out your reasoning, use clear language to evaluate options, refine ideas and justify decisions. Support students with checklists, reflection questions or sentence starters like, 'I thought of creative ideas'; 'I thought about who will use it'; 'I'll keep trying if it doesn't work'; 'I'll make it safe and easy to use'; and 'I'll choose the best materials and methods'.

Explore creative possibilities by guiding students through focused prompts that encourage them to think differently about materials. Use a think board or a learning folio to capture ideas, prompting students with questions such as, 'what else could you use instead?' (divergent) or 'how could materials be combined or rearranged?' or 'what materials best meet the design needs?'(convergent). Students then critically analyse and innovate their choices. Through this process, they think critically and improve their ideas by exploring alternatives, narrowing choices, and refining their designs to make informed decisions.

Facilitate a list of materials to support design solutions. Students evaluate each based-on experience and record choices with reasons. In pairs, they give feedback and ask questions.

Prototype – produce a model or early version of possible solutions

Key questions

- How can you start creating your design using the materials and ideas you have tested?
- Now that you have refined your ideas, what will your prototype look like? Can you explain what you want to make and why?
- What do you need to do first? What will be the next step?
- Are there any challenges you think you might face while building your prototype? How can you solve them?
- Are there any materials or tools you need to check or prepare before you start building?
- How will you take care of the materials and tools while building your prototype?
- How can you make sure your prototype works well and meets the needs of the problem?
- What would you like users to feel or experience when they use your prototype?
- How can you make sure your prototype is safe, easy to use, and works as you planned?
- What will you do if something doesn't work as expected? How will you make changes to improve it?
- How will you manage your time to make sure you finish building your prototype?
- What will you do if you run out of time or materials?
- How can you work together with your team to build the prototype, share ideas and assign roles to make sure everyone is involved and knows what to do next?

Possible activities

Evaluate initial plans and drawings before building by self-assessing each component. Students use their learning folio to label the materials they will use and explain how each part functions and why it is important to the design. Arrange areas with different materials and encourage students to select those needed to begin creating their prototype.

Revisit the learning intentions and success criteria. Ask students to reflect on their prototype and identify how well it meets the success criteria, using simple prompts or a checklist. Encourage suggestions for changes before moving into the evaluation phase.

Critique and review design drawings, then create a 'design ladder' or layered blocks template (learning folio or digital, such as Padlet). Identify each component's role and the order it should be developed. Students separate parts (materials, functions, steps) and label each layer with its role and sequence. Emphasise building order and how layers connect to support a logical design flow.

Provide time for reflection and an opportunity for a 'fix-it' task. Students test the initial build of their prototype and identify improvements. Students engage in a feedback process with a peer and discuss their observations, refining their design further.

Demonstrate how to test small parts before building the full prototype by modelling a 'think-aloud' process. Encourage students to use a Predict, Explain, Observe, Explain (PEOE) chart to document and reflect on their testing. For example, they might say: 'I am checking if this part holds its shape,' or 'before I build the whole thing, I want to see if this wheel turns smoothly.' This shows the value of iterative testing and builds confidence in refining ideas before committing to a final design.

Model how to use testing stations before student's trial materials (for example, strength, flexibility, waterproofing). Use 'think-alouds' or gestures to explain reasoning. Students test materials, score their usefulness and record findings via voice notes, drawings, or a learning folio. As a class, compare findings with a Venn diagram sorting circle or a simple graph to support discussion.

Implement a test, tweak and try again cycle. Encourage students to focus on improving one thing at a time and to record in their tests and changes in a design journal. They can use iPads to document changes with photos or videos, illustrate modifications in their journals or update the original design plans to show progress

Model how to change small parts of a prototype, one at a time, encouraging students to test each change before moving on to the next. This helps students understand the impact of each modification and promotes careful, step-by-step problem solving.

Evaluate – test your design and share what you found

Key questions

- What worked well in your design? What parts? What materials?
- Did your design meet the goals or rules you set at the start?
- How does your design answer the driving question?
- Does your design do what you wanted it to do?
- Did the materials you used help or make it harder for your design to work? How?
- Did you think about safety when making your design? What did you do?
- What did not work as you expected?
- How could you make it better?
- After testing your design, what was the best part?
- What did you learn from making this design that you can use next time?
- What did you find out when you tested your design?
- Can you explain why your design is good or needs improvement?
- What creative ideas did you use in your design to solve the problem in a new way?
- Did anything happen that you didn't expect? What did you do?

Possible activities

Use an iPad or camera to photograph or record designs as they are being tested. Students compare the working parts to their drawn designs, documenting what works well and what needs improvement. This visual diary helps them track changes, reflect on their testing process and think about how to adjust their designs for better results.

Review and self-assess the design ladders or layered blocks templates in their learning folio to check if the correct sequence was followed when building their prototypes. Use a Plus, Minus, Interesting (PMI) chart to evaluate what worked well and what to improve, recording reflections in learning folios. In groups, share evaluations and strategies, explaining how challenges were overcome. As a class, reflect on common patterns or approaches, using a discussion prompt, such as ‘Two Stars and a Wish‘.

Organise a designated testing area where students can try out their designs. Encourage them to test different parts of their prototype, like how well it moves, holds weight, or performs its intended task. Support the evaluation process by using true or false question cards tailored to the task, helping students focus their observations. After testing, students identify which parts worked well and which need improvement, then discuss their findings in small groups.

Support students in a class or small group reflection where they share feedback on their designs using a TAG template or a Guided Feedback Chart to guide the discussion. Students think about what worked, what did not and what creative changes could improve their design. Encourage them to revisit the driving question or problem to assess how well their design addresses it and identify improvements needed to better solve the challenge.

Facilitate an exit ticket task where students reflect on their prototype progress by answering two prompts: ‘What part of your prototype worked well today?’ and ‘What would you change or improve next time?’ This helps students consolidate their thinking about the prototype process and prepares them for the next iteration. For younger students, adjust the task by using visual prompts or gestures such as smiley face, sad face, thumbs up, or thumbs down emojis, or inviting them to draw their responses.

Compare the original design plan with the final tested prototype by creating a before-and-after map. Include drawings or photos of both versions and label key changes. Explain why changes were made and how they improved the design. This visual reflection shows how thinking and problem-solving developed throughout the design process.

Iterate – reflect and improve your solution

Key questions

- What new ideas or changes could make your design even better?
- Is there something from earlier in the process that you want to go back and change?
- What parts of your design could work even better if you changed them?
- How would your changes affect the overall function or performance of your design?
- What feedback or ideas from others would you like to use to improve your design? Why?
- Can you think of a way to make your solution stronger, safer, or more effective?
- What parts of your design need to be tested again to make sure they work well?
- Did anything unexpected happen when you tested your design that could be improved?
- How will you document your changes so others can understand your design improvements?
- If you made it again, what would you do differently? Can you draw or tell me what your next design might look like?
- What skills did you improve during this design process that will help you next time?

Possible activities

Review and reflect on designs and original plans to see if students' ideas still work after testing. Students create a 'then and now' comparison chart, SWOT analysis or storyboard in their learning folio to visually or verbally describe what they originally planned, what changed during testing, and why.

Analyse all the developed materials from previous phases, such as the living list, class carousel recordings, entry and exit ticket tasks, mind maps, and sticky note maps. Ask students to determine if their design shows empathy, considers different perspectives, and addresses the driving question or problem. Guide students to explain how their design reflects these aspects by asking reflective questions such as 'Who is this for?', 'Does it solve their problem?', and 'How would they feel using it?'. Model how to think critically by giving examples like, 'If this product was made for me, I would feel...', or 'If this prototype was made to help an animal, it should...'. Encourage students to update their designs based on these reflections.

Emphasise the build phase by guiding students to refine their prototypes. In pairs or small groups, students choose a part of their design to improve using tools such as a POOCH or a decision-making matrix. They decide what tools, materials or steps are needed (e.g. fastening small components, measuring accurately, assembling parts) and justify why these changes will improve their design.

Conduct a green (ready to go), amber (needs some improvement) and red (needs some major changes) light check-in. Students review their design, justify their choice using testing evidence or feedback, then work in pairs or small groups to share reasons and suggest one focused improvement if needed. Students record their traffic light choice and reflections using a paper-based template, mini whiteboards or digitally via Padlet or Microsoft Whiteboard.

Guide students to use the feedback and evaluation from the previous phase to discuss and decide the steps needed to test and adjust their prototype in small steps. Encourage them to make one change at a time, record the result, and reflect on how each adjustment affects the overall design. This step-by-step approach helps students see the impact of feedback on each modification and builds careful, evidence-based problem solving

Communicate – share your ideas with others

Key questions

- Who might use your design in real life? What would they say about it?
- Who would you like to show or tell about your design?
- What do you think is the best way to share your design and ideas?
- How can you make your explanation clear and interesting for different audiences?
- What visual aids or tools could help you share your design more effectively?
- How did working with others influence your design and ideas?
- How can you explain what you learned and improved?
- What did you find out while working on your design?
- What would you do the same or differently next time?
- What questions do you think people will ask about your design?
- What do you want others to notice or understand about your solution?
- How can you respond respectfully to questions or feedback from others?
- How can you listen carefully to ideas or suggestions from others?

Possible activities

Showcase students' final designs and share how they work, what materials were used, and what changes they made during testing. This can be done in a class gallery walk, buddy class visit, video, or whole-class presentation. Optionally, plan a larger celebration such as a whole-school or cross-grade showcase. Invite school community members to visit and see students' ideas on display. Students can explain their thinking, answer questions, and receive feedback from a wider audience.

Develop an EDP reflection journal or use learning folios to write or draw responses to simple prompts such as: 'My design helps because...'; 'One change I made was...' ; 'I am proud of...' and 'Next time, I would...'

Set up a class exhibit showcasing final prototypes, initial drawings, and a brief description of the problem and solution. Support students to write captions using sentence starters or scaffolded templates. Encourage reflection on how their design evolved and met the design criteria. Consider inviting peers and families.

Support students to capture their learning in a short reflection. This could be a drawing, a voice recording, or a few sentences in their learning folios about what they learned by sharing their design.

Guide students to create a slideshow, short video or photo diary using a digital device to record their learning experience throughout the EDP.

Demonstrate how to use visuals to communicate ideas creating labelled diagrams or posters that clearly show how a design works and outline the steps followed in the process. Introduce speech bubbles as a way for students to explain their thinking, ask questions, or highlight key features. Provide sentence starters to help students articulate their ideas, such as 'This part…', 'I chose this because…', or 'Next, I will…'. Encourage students to use colour, symbols, or arrows to make their visuals clearer and more engaging. Support them through guided practice, giving feedback on clarity and detail.

Model how to share, receive and reflect on audience feedback. Explain the purpose of feedback as a tool for improvement, not just praise. Prompt reflection by asking questions like 'What did people notice?', 'What questions were asked?', or 'Did you learn anything that might help improve your design in the future?' Use strategies like TAG, Glow and Grow, Even Better if (EBI), I like.. I wonder or Two Stars and a Wish to help students give meaningful responses.

Glossary of terms

This glossary supports both teachers and students by clearly defining key vocabulary related to each step of the Engineering Design Process. It promotes consistent use of language, helps build students' understanding and ensures everyone shares a common language when discussing ideas, problems and solutions throughout STEM activities.

Brainstorming: Thinking freely to generate as many ideas as possible. Brainstorming helps explore lots of possible solutions without worrying if they are right or wrong, encouraging creativity and teamwork.

Collaboration: Working with others to achieve a shared goal by communicating clearly, respecting different ideas and contributing to the group's success. It involves cooperation, empathy and adapting to diverse strengths and perspectives.

Constraints: The rules, limits or challenges that must be considered when solving a problem. These can include time, materials, size, or safety and help guide realistic and thoughtful design.

Convergent thinking: Narrowing down ideas to identify the most effective solution by analysing, evaluating and selecting based on clear criteria. It complements divergent thinking by refining creative ideas into practical outcomes.

Creative thinking: Generating new and original ideas, making connections between different concepts and exploring new ways to solve problems. Creative thinking encourages students to think imaginatively and innovatively.

Critical thinking: Thinking carefully and logically to understand information and make decisions based on evidence. It helps students ask thoughtful questions, consider different perspectives and make well-informed choices.

Design brief: A short description of the challenge or problem to be solved, including any specific needs or limitations.

Divergent thinking: The process of exploring multiple ideas or solutions to a problem. It promotes creativity and innovation by encouraging open-ended thinking without concern for right or wrong answers.

Driving question: This is the main question that guides the project or problem-solving process. It challenges students to stay curious, explore solutions and remain engaged.

Empathy: Understanding how others feel and thinking about their needs when designing solutions. It includes listening and talking about different perspectives.

Engineering: The process of designing, building and improving solutions to real-world problems using science, technology, mathematics and creativity. It involves testing ideas, refining designs and working through challenges to create practical outcomes.

Evaluate: To look closely at something to decide how well it works and what can be improved.

Feedback: Receiving advice and information to improve ideas or work, leading to better outcomes.

Ideate: The process of coming up with ideas to solve a problem.

Innovation: Creating new and improved ideas, designs, or ways of doing things. Innovation builds on creative thinking and helps solve problems in original or more effective ways. It involves trying new approaches, improving existing ideas and thinking beyond usual solutions.

Iteration: Making changes and improvements by trying things again and refining ideas or solutions.

Problem solving: Identifying challenges, exploring solutions and choosing the best approach. It involves testing, refining and considering diverse perspectives to improve outcomes and build resilience.

Prototype: A model or early version of a design used to test and improve ideas before creating the solution.

Re-design: Making changes to improve a design based on testing or feedback. It shows how we can learn from what did not work to make something better.

Reflection: Thinking about what worked well and what could be improved to learn from experience and strengthen future work.

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