Engineering Design Process Tabletop Phase Cards

About the EDP tabletop phase cards

The tabletop cards are designed to support students as they work through each phase of the Engineering Design Process (EDP).

Each card features:

- The phase name and a brief description
- Student-friendly prompt questions to guide thinking and collaboration
- Icons that match the theme of each question (for example, communication, materials and tools, focus)

How to prepare

- Print each card (A4)
- Fold along the faint middle line
- Laminate for durability (cards may be used individually or grouped with a ring or in a binder).

How to use

Place the relevant phase card on the table during STEM engineering design activities.

Students use the questions to:

- Clarify ideas
- Share and discuss thinking
- Make decisions
- Stay on track

These cards support shared language, teamwork, and independence as students complete EDP tasks.

Define

clarify the driving question or problem

- What do we need to make?
- What is the problem?
- Who will use it?
- What things can we use to make it?
- What do we need to do to solve the problem?
- What do we need our design to do?

Sentence starters

The problem is...

We need to make something that...

My idea is to make...

Our design must...

Our materials are...

This will work because ...

I'm not sure about this...

Identify

think, ask questions, research and plan

- What do we know?
- What do we need to find out?
- What must our design be able to do?
- What might be tricky?
- What materials or tools might work best?
- What do we need to remember when we make it?

Sentence starters

We already know that...

We need to find out more about...

We could use...

We might need to check if...

I wonder if...

We might need to also think about...

I think it will be tricky to...

Our design needs to...

Brainstorm

encourage curiosity and generate ideas

- What ideas can we think of?
- How will we share and explain our ideas?
- What might be tricky about choosing the best idea?
- How can we decide which idea works best?
- What do we already know that can help us decide?
- What can we use to make it work?

Sentence starters

What if we tried...

What would happen if...

An idea that might work is...

This design works because...

Another way to do this could be...

We could use ... to make...

This design will help...

We could make it look like...

Let's make... because...

Design

draw and communicate potential solutions

How can our drawing show how the design works?

How will we label, show and explain how our design works?

How can we show our ideas in drawings to test our thinking?

How can we make sure our plan shows all the important details?

What can we learn while drawing our design?

Do we need to add anything to improve our design?

Sentence starters

Our drawing helps us think about...

We can explain our ideas by...

We will label and show...

We might need to add...

Our plan helps us see...

We will now remember to...

We discovered that ...

Planning and drawing helped us...

Prototype

produce a model or early version of possible solutions

- What do we need to make?
- What is the problem?
- Who will use it?
- What things can we use to make it?
- What do we need to do to solve the problem?
- What do we need our design to do?

Sentence starters

The problem is...

We need to make something that...

My idea is to make...

Our design must...

Our materials are...

This will work because ...

I'm not sure about this...

Evaluate

test your design and share what you found

- Does our design do what we planned?
- How can we explain what worked well and what was challenging?
- What didn't work as we expected?
- Did our materials and choices help our design?
- What surprised us when we tested out prototype?
- Did our design solve the problem? How do we know?

Sentence starters

Our design worked well becasue...

We tested our design by...

Next time, we will...

We found out that...

This part didn't work because...

We were surprised by...

We learned that the materials...

It was hard to...

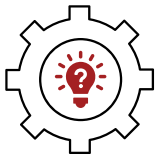
We solved the problem by...

Iterate

reflect and improve your solution

What could we change about our design to make it better?

How can we use feedback to make our design better?



What new ideas can help us improve our design?

If we made it again, what would we do differently?

Is there something we need to change from our first plan?

How can testing help us make our design more useful?

Sentence starters

We improved our design by...

We changed...because...

We made it more useful by...

Our idea was to...

If we made it again we would...

Testing showed us that...

We changed it so it works better for...

We learned that our design can...for...

Our design works better when...for...

Communicate

share your ideas with others

What did we learn that we can share with others?

How can we share our design and explain how it works?

How did working together help us with our ideas?

If we made it again, what would we do differently?

Who could use or benefit from our design in real life?

What do we want others to notice or understand about our design?

Sentence starters

We will share our design by...

Our design works because...

We want others to notice...

Working together helped us to...

We listed to feedback and ...

We can explain our ideas by...

Next time, we would...

The most important thing is that...

In real life, our design could...

Engineering Design Process Lanyard Role Cards

The lanyard cards support teamwork and equitable participation during Engineering Design Process tasks.

Each card assigns a role with a clear purpose and guiding questions.

These roles support STEM skill development, encourage collaboration, and promote shared responsibility and purposeful engagement.

The six roles are:

- Idea Builder
- Communicator
- Project Engineer
- Materials Manager
- Solution Tester
- Reflector

Every role builds important STEM capabilities such as creativity, communication, problem-solving, organisation, testing and evaluation, and reflection.

How to prepare

- Print and laminate each card
- Attach to a lanyard for easy use

How to use

- Assign roles within each group
- Students use the questions on their card to support their responsibilities
- Roles are rotated for each new task to ensure all students experience each responsibility

Idea Builder

Leads brainstorming and keeps creativity flowing.

- What ideas can we think of?
- How can we make our idea better or stronger?
- Which idea best solves the problem and why?

Communicator

Shares team ideas, listens carefully and helps everyone have a voice.

- How will we explain our design to others?
- Did everyone have a turn to share?
- What is the best way to tell others what we learned?

Project Engineer

Makes sure the team follows the plan and drawings, works safely and completes each step.

- Are we following our plan and drawings?
- What step do we need to do next?
- How can we check that our prototype matches the design?

Materials Manager

Collects, organises and returns materials. Helps the team use resources wisely.

- What materials do we need for our design?
- Are we using our materials carefully?
- How can we reuse or recycle materials in our design?

Solution tester

Tests the prototype and records what works or needs improvement

- Does our design do what we planned?
- What worked well?
- How can we make it better?

Reflector

Guides reflection on what was learned, what worked and how to improve.

- What ideas can we think of?
- How can we make our idea better or stronger?
- Which idea best solves the problem and why?