

Novel Engineering

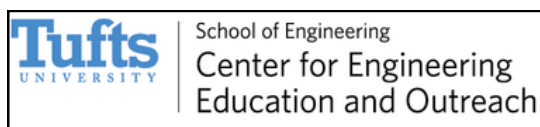


NOVEL ENGINEERING

Novel Engineering is a learning approach where students use stories as a starting point to solve problems. While reading a story, students identify challenges faced by the characters and then design real world engineering solutions to help them.



WHERE DID IT BEGIN?



Novel Engineering began at Tufts University in the United States. It was developed by researchers who wanted to help students see engineering as part of everyday life, not just something technical or difficult.

WHY DID IT BEGIN?



Many students often think engineering is something complicated and separate from their daily lives. However, they naturally enjoy stories and easily connect with the characters.

Traditional reading activities often focus only on understanding the story and don't give students a chance to think creatively or solve problems.

By combining storytelling with engaging design thinking, Novel Engineering helps to bridge this gap. It allows students to see how engineering can be used in everyday situations, making both reading and engineering more engaging, meaningful and fun, especially for beginners.

WHY DOES IT MATTER?

- Promotes deeper reading and comprehension
- Enhances critical thinking
- Encourages collaboration and communication
- Fosters empathy and creativity

NOVEL ENGINEERING AND STEAM

Novel Engineering naturally brings together all areas of STEAM: Science, Technology, Engineering, Arts, and Mathematics. Stories act as the starting point, offering real-life situations where students can identify problems and design solutions. Through this approach, students develop important STEAM skills such as communication, creativity, critical thinking, collaboration, analytical thinking, and problem-solving in an engaging and meaningful way.



HOW DOES NOVEL ENGINEERING SUPPORT EACH STEAM AREA?

Science:

Students apply science concepts (force, materials, environment) to solve story problems.

Technology:

They use digital tools or simple tech (Scratch, sensors, circuits) to create solutions.

Engineering:

They design, build, test, and improve prototypes based on story challenges.

Arts:

Stories build imagination, empathy, and creative expression through design and storytelling.

Mathematics:

Students measure, estimate, and calculate to make designs realistic and functional.

PROCESS OF NOVEL ENGINEERING

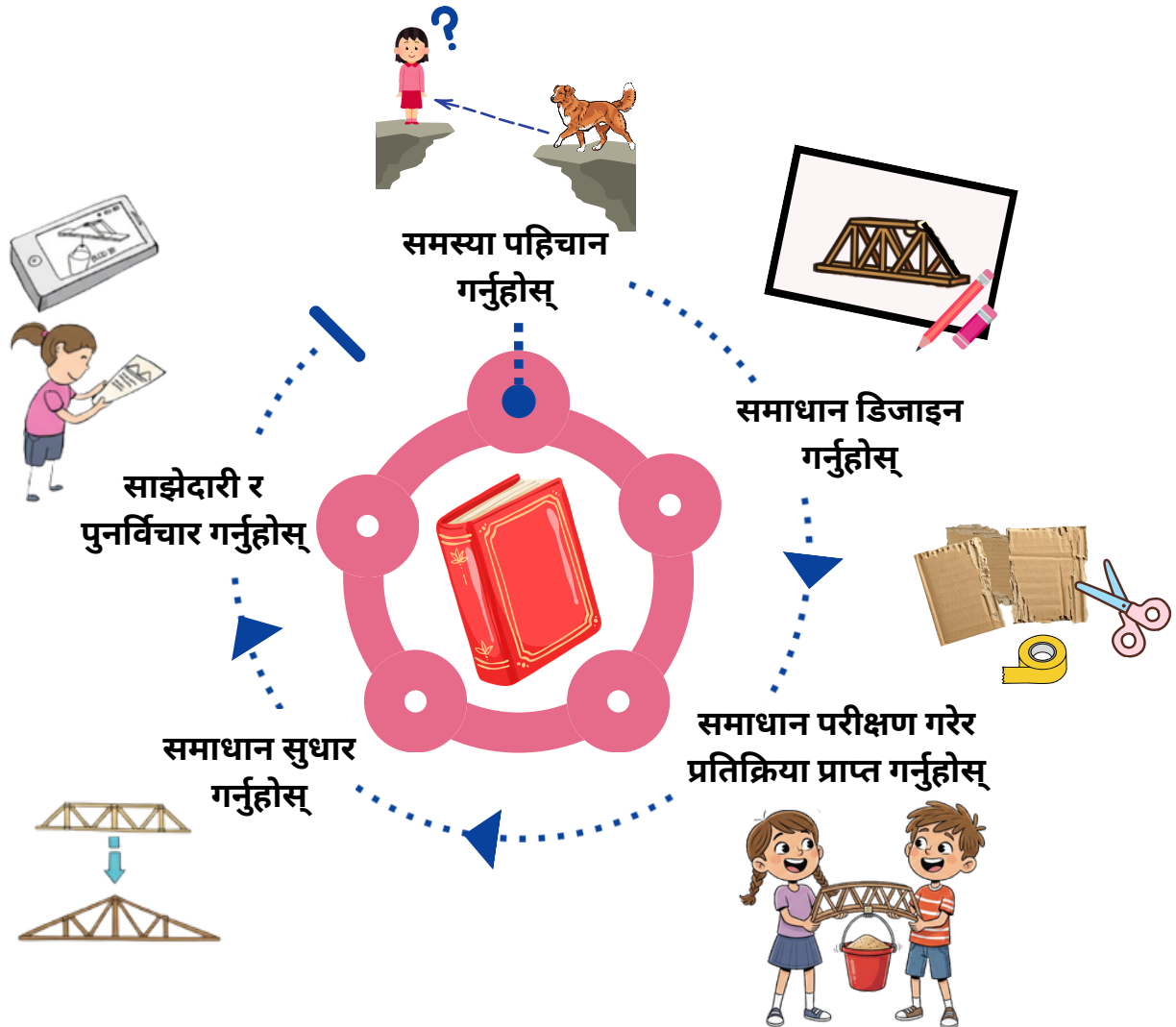


Fig. Process of Novel Engineering from K-8, CEEO

1. SELECT A BOOK/STORY

When selecting a story, look for one with clear characters, challenges, or problems. Choose a story that suits the age and interests of your students, and one that sparks creative thinking and problem-solving. The story can be imaginative, a folk tale, a historical event, or even a local legend, anything that inspires curiosity and innovation.

2. READ STORY AND IDENTIFY THE PROBLEM

Read the story carefully with your students, encouraging them to pay attention to the characters and events. Invite them to think from the perspective of the characters, focusing on empathy and understanding.

Questions you can ask:

- What challenges or problems are the characters facing?
- What makes their situation difficult?
- Which problems could be solved using engineering or creative design?

3. DESIGN SOLUTION

Encourage students to come up with multiple ways to solve the problem. Remind them that there are no wrong answers, the goal is creativity. Have students write down or sketch their ideas. Discuss how their designs could help the characters in the story. Encourage collaboration and teamwork throughout the process.

4. BUILD AND TEST SOLUTION

Students create a model or prototype of their design using simple materials. Encourage them to test their solution: what works, and what doesn't? Remind them that it's normal if the first attempt isn't successful. Emphasize learning from failures and improving the design. Make the process fun, safe, and creative.

5. GET FEEDBACK AND ITERATE

Make students collect feedback from peers and the teacher. Encourage them to make changes to the design based on the suggestions received. Remind students that engineering is a continuous cycle, testing and improving never stops. Celebrate the process, not just the final product.

6. SHARE AND REFLECT

Have students present or demonstrate their designs in the classroom. Encourage them to explain how their solution helps the characters and what they learned through the process.

Reflection Questions:

- What went well?
- What could be changed next time?
- What new skills or ideas did you discover?

QUESTION TEMPLATE FOR NOVEL ENGINEERING

<https://drive.google.com/file/d/1Vk2RV-jTUkMKTa5jCxsUhmAfQ5lrE6Fj/view?usp=sharing>

USEFUL LINKS

<https://www.letsreadasia.org/>

<https://friendspeaceteams.org/nepali-story-collection/>

<https://sites.tufts.edu/novelengineering/>

<https://www.freechildrenstories.com/>

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