

Designing a Bridge 設計橋樑

Context

At the beginning of this project students were presented with the challenge: how can you make a bridge that will hold as much weight as possible? From there we investigated and researched various types of bridges, which shapes are strongest, and the forces of tension and compression in bridge design.

Task

Through our discussions and inquiries the students were given the task to design, create, and test the strongest bridge given limited resources. The design aspect of their bridges was done through multiple steps consisting of pros & cons, individual design and group collaboration. In the creation stage, students were given a set amount of materials, knowing that any mistakes would require them to re-evaluate their direction. Testing was the final and most exciting step for the students. We did the testing by hanging weight from the bridge until it snapped and collapsed. They made estimations beforehand and then compared those to the actual results.

Conclusion

The students had an enjoyable time with their firsthand experience creating and testing different ideas. They also learned how to work together as a team to accomplish the task set forth. This included splitting up responsibilities and making sure everyone in the team was doing their job to the best of their ability.

背景

在這項專題開始時，學生面臨一個挑戰：如何建造一座能夠承受最大重量的橋樑？從這裡我們調查和研究各種類型的橋樑，哪種形狀最堅固，以及橋樑設計中的拉力和壓力。

任務

透過討論後，學生利用有限的資源開始設計、建造並測試最堅固的橋樑。橋樑的設計是通過許多步驟完成的，包括利弊、個人設計以及小組合作。在建造的階段，學生利用一些材料製作，並清楚知道任何一個錯誤都會需要重新評估建造的方向。測試階段是最後也是最刺激的一步，學生將一些重量放到橋上，直到橋斷裂坍塌。他們事先估計重量，再與實際結果進行比較。

結論

學生親身經歷創造以及測試不同的想法來造橋，並度過愉快的課堂時光。他們學會如何透過團隊合作來完成被指派的任務，包括分工負責，並確保團隊中的每個人盡其所能地完成自己的工作。

1 ASK + IMAGINE 提問 + 創思



Students discussed design elements, shapes, and researched bridge types.
學生討論設計元素、形狀並研究橋樑類型。

3 PLAN 計畫



Groups worked together to complete a detailed design for their bridge.
各小組共同努力完成橋樑的詳細設計。

4 CREATE 創造



Group collaboration was key in creating the bridges.
團隊合作是建立橋樑的關鍵。

5 IMPROVE 改進



After testing, students analyzed areas for improvement.
測試後，學生分析需要改進的地方。

6 PRESENT 展現

Students analyzed their outcomes and shared their results.
學生分析他們的成果，並分享他們的結果。

