

# INCORPORATING STEM LEARNING ACTIVITIES IN THE SCHOOL MATHEMATICS CURRICULUM

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## THEME:

Innovative STEM pedagogy and curriculum

## BACKGROUND AND AIMS

Mathematics is one of the critical elements of STEM education. However, the importance of mathematics has not been fully emphasized in the practice of STEM education (Martín - Páez et al., 2019). Promoting STEM education in mathematics education is one of the focal points of the Hong Kong school curriculum (CDC, 2017). In this study, we introduced an innovative STEM learning activity in the classroom based on the topic of 3D shapes in the primary mathematics curriculum. The aim was to provide an example of a school-based mathematics curriculum integrated with STEM education and offer teachers the design and development of STEM pedagogy.

## METHODOLOGY OR PROCESS(ES) UNDERTAKEN

Focusing on the learning objective of recognizing the concept of 3D shape, we designed an interdisciplinary STEM learning activity in grade two in a Hong Kong primary school. Students learned the concept of a cylinder in the *Funny Zoetrope Project*. A curriculum consultant, a mathematics teacher and a visual art teacher collaborated to implement the whole teaching design within seven lessons (five mathematics lessons and two visual art lessons). A series of learning booklets were designed for teaching and learning. Regarding the process of preliminary preparation, teaching arrangement, course implementation, and after-class feedback, the STEM learning activity was incorporated into the school-based mathematics curriculum.

## RESULTS AND CONCLUSIONS

The STEM learning activity based on the mathematical topic provides students with opportunities to see, know and understand the mathematical concept in STEM education. Students experience interdisciplinary learning during the process of making a zoetrope. They learn to integrate and apply knowledge and skills they have learned in mathematics and visual art. Some generic skills such as problem-solving, collaboration, communication, and self-assessment skills are also developed.

## REFERENCES

- Curriculum Development Council (CDC) (2017). *Mathematics education key learning area curriculum guide* (Primary 1 to Secondary 6). Hong Kong: Hong Kong SAR Government.
- Martín - Páez, T., Aguilera, D., Perales - Palacios, F. J., & Vílchez - González, J. M. (2019). What are we talking about when we talk about STEM education? A review of literature. *Science Education*, 103, 799-822.