

- Teacher guidelines for case study - Green buildings: Hong Kong Science Park / Zero Carbon Building / Towngas Headquarters



Generic green skills

Cognitive competencies:

- Systems and risk analysis, skills to assess, interpret and understand both the need for change and the measures required
- Environmental awareness and a willingness to learn about sustainable development
- Innovation skills to identify opportunities and create new strategies to respond to green challenges

Interpersonal competencies:

- Marketing skills to promote greener products and services

Technological competencies:

- Management systems (waste, energy, water)
- Impact and use minimization



Learning objective

Students are expected to:

1. Recognize the different green technologies used in green buildings and understand how they work
2. Identify technologies used in green building that can be adapted for use on campus or workplace to improve an environmental performance
3. Advocate ideas effectively



Format

Individual and pairs and small group work



Role of teacher

Facilitator



Resources needed

A3 paper, colored pencils, student worksheet, case study



Time required

1.5 hours



Assessment

The assessment will be based on:

Students' group presentation to see how students market green technologies that can be used in specific sites. Students should explain why we need the identified green technologies and how will they work.

Suggested teaching and learning sequences

Part 1: Whole class activity

1. Split students into groups of six.
2. Whole class sharing for the pre-class reading: what are the differences between green building standards in Hong Kong and Mainland China? Teacher can invite students to express their thoughts randomly and organize their responses in a mind map.
3. Ask two students to pick one green building to work on. Students fill in the worksheet in pairs.
4. Group sharing: Give students 10 minutes to share their findings with the group about different green buildings cases.
5. Presentation to the whole class: invite three students to present on the green buildings introduced in the case study. Teacher needs to provide comments and highlight missing information.

Part 2: Group discussion and presentation

1. The teacher guides students to choose one site (campus/community/workplace) to further think about **what and how green technologies identified can be used to green the campus (or workplace or community)**. Teacher can also remind students to reflect on the environmental issues identified on campus or on other sites during from other activities.
2. Facilitate the whole class sharing. Invite groups to do a group presentation to share their ideas with reference to the discussed question.

Suggested answers/examples for the activities

Discussion

1. What are the differences between green building standards in Hong Kong and China?

Hong Kong has formulated the evaluated items according to the different functions of different buildings. This approach is more holistic. One of the principles, 'Innovations and Additions', can encourage companies and people to use green technology or sustainability innovation strategies to green their buildings.

The China standards pay more attention to land saving, as they include this as one of the categories.

Teachers can also guide students to discuss the differences and similarities between these two standards from different perspectives and provide suggestions to improve the effectiveness of each.

2. Which green technologies have been used in these three green buildings? How do they work?

Green technologies	How do they work?
e.g. Natural daylight is used by employing roofing material, which has high transparency properties.	'Green 18' used this material to construct the roof, which can effectively introduce natural daylight to different areas of the building.
Automatically controlled lighting system	Daylight utilization maintains a defined level of light by adjusting the output of shiners to compensate for surrounding light levels. The system uses photocells to measure the surrounding light and then automatically controls the on/off of the shiners to achieve a user-defined level of light.

3. What, and how, can the green technologies be used to green the campus (or workplace or community). Students make a poster for the group presentation to market the identified technologies on campus (or workplace or community)?

Since the Hong Kong Science Park and Zero Carbon Building have been designed based on green building standards, many of the green technologies they used cannot be utilized in existing buildings. Teachers can guide students to think about how to adjust these technologies for existing conditions. In addition, the Towngas Headquarters case is a good example of greening an existing building by adopting advanced energy efficiency technologies, as well as best practice for facilities management.

Reference:

Green Buildings and the City. (2012). Retrieved from <https://www.wwf.org.hk/en/?6483/green-buildings-and-the-city>

Towngas Headquarters is the first non-residential building in Hong Kong to achieve Platinum rating under BEAM Plus Existing Buildings v1.2. (2016). Retrieved from https://www.towngas.com/getmedia/8fba4dea-3efb-4577-8d01-a063b809f6c9/20160810_Towngas_BEAMPLUS_Press-Release_Eng-Final.pdf.aspx?ext=.pdf

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