



~Inquiry Based Learning program with backcasting as a pillar~

Class Connecting to the Future



Research Center for
Regional Co-creation Basis
Shibaura Institute of Technology

Program Overview

As shown in the figure, this exploration program consists of four units:

Unit 1: Future Thinking: Backcasting, Unit 2: Climate Change and Regions, Unit 3: Future Mayor Workshop, and Unit 4: How to Create Policies to Change the Future.

In "Unit 1: Future Thinking: Backcasting," students will learn about backcasting, which is essential for thinking about the future, while comparing it to forecasting, which is another way of thinking about the future.

In "Unit 2: Climate Change and Regions," students will learn about how the climate change problems that their generation will face will affect the region, and the policies and technologies to mitigate them, and subsequently use an application, "Carbon Neutral Simulator" (CNS) to experience the path toward decarbonization in the region and consider the measures for decarbonization.

In "Unit 3: Future Mayor Workshop," participants will discover future issues based on the 2050 projections of their own community ("Future Chart"), and discuss ideas in groups about "what society and they should do now" to solve those issues.

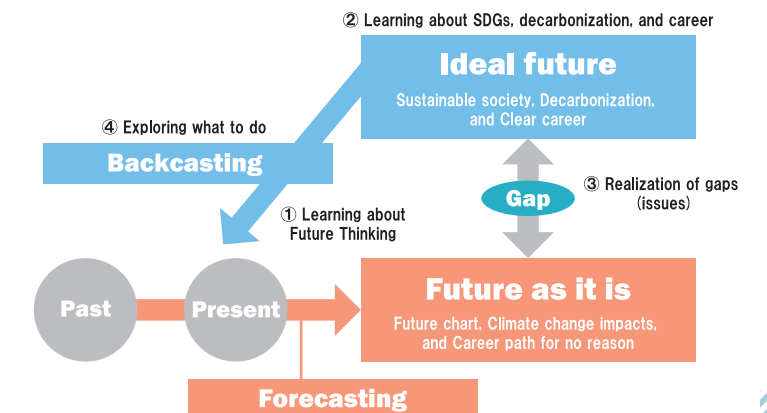
In "Unit 4: How to Create Policies to Change the Future," participants learn the importance of policies to change society and institutions and work in groups to develop policy proposals to solve future issues and a roadmap for their realization.

These four units have in common the idea of "thinking from the future with backcast thinking." The classes are "connected to the future" through backcast thinking on different scales: global, regional, school, and individual.



Backcasting and "SDGs x Climate Change Education x Career Education"

"Backcasting" is a way of thinking in which you define your ideal future and then think backwards about the path from the present to your ideal future and "forecasting" is the opposite way of thinking wherein the future is thought of as an extension of the present. Forecasting is a way of thinking based on trends from the past to the present, such as weather forecasts, and therefore cannot respond to unexpected events or envision a future that will drastically change society into a sustainable or decarbonized one. On the other hand, backcasting is more suited to thinking about how to respond to unexpected events and how to realize a future that is impossible according to conventional wisdom, such as a sustainable society or decarbonization, because it first envisions an ideal future.



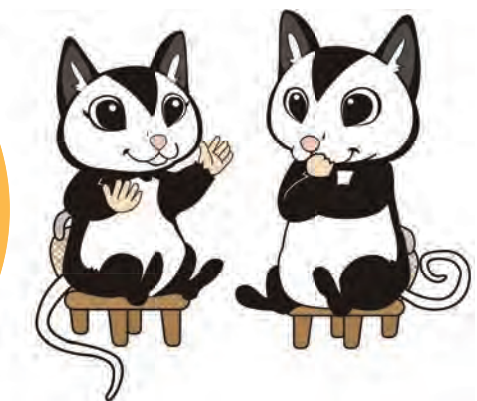
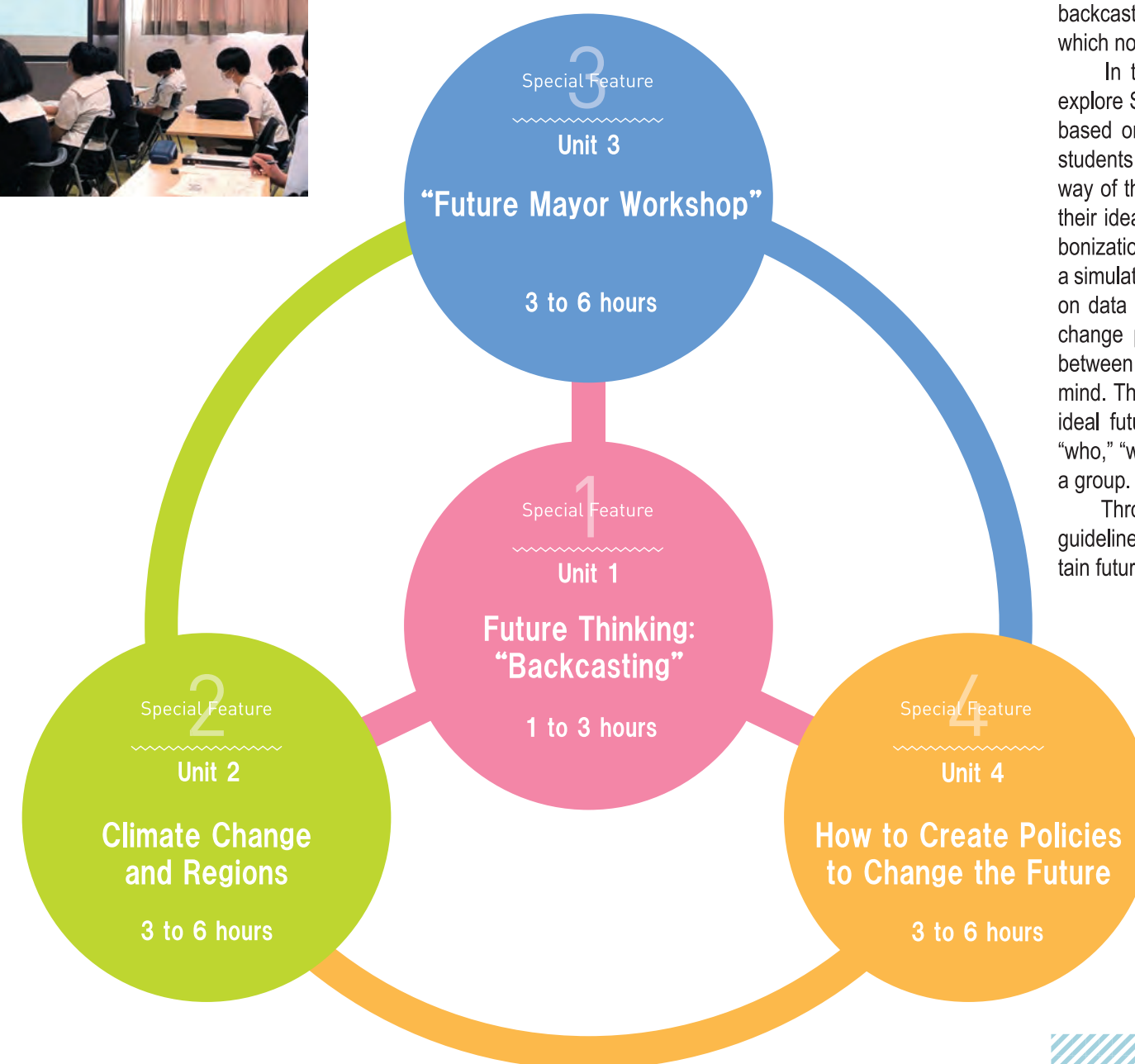
For example, the Sustainable Development Goals (SDGs), which have received much attention in recent years, are goals designed with backcasting to realize "a sustainable society in which no one is left behind."

In this program, students learn about and explore SDGs, climate change, and their careers based on the pillar of backcasting. Specifically, students will first learn about backcasting as a way of thinking about the future, and then about their ideal future in a sustainable society, decarbonization, and careers. Then, by learning about a simulation of the future if nothing is done, based on data such as the "Future Chart" and climate change projections, we can recognize the gap between our ideal future and the one we have in mind. Then, to eliminate the gap and realize the ideal future, students are asked to think about "who," "when," and "what to do" individually or as a group.

Through this program, students can obtain guidelines for living in their own way in an uncertain future with no right answers.

Key Points of Program Development

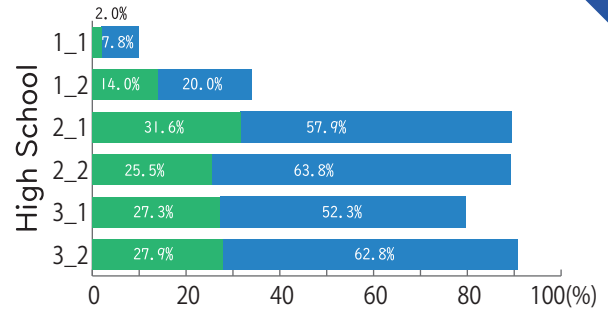
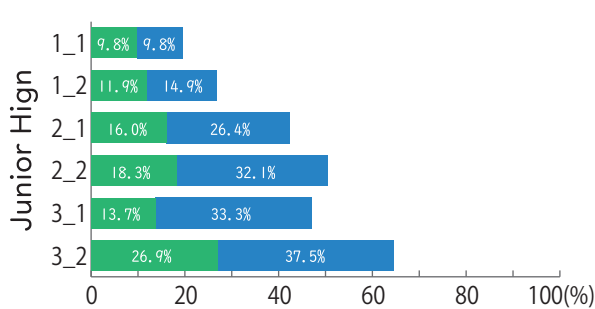
- ▶ Compliance with the Courses of Study in Japan.
- ▶ Programs that lead to the "independent, interactive and deep learning" of students
- ▶ Developed as a curriculum of about 20 hours (studied over 3 years), not as a single class
- ▶ Curriculum consists of four units that can be selected and combined according to each school's "educational goals" and "qualities and abilities to be acquired by students."
- ▶ Development of teaching plans, teaching methods, teaching materials, evaluation methods, and training programs for teachers and staff to enable continuous implementation at school sites
- ▶ A future decarbonization information platform that can be used by any school
- ▶ For high schools, the information can be included in portfolios (e.g., JAPAN e-Portfolio), that are being considered for use in the reform of university entrance examinations.



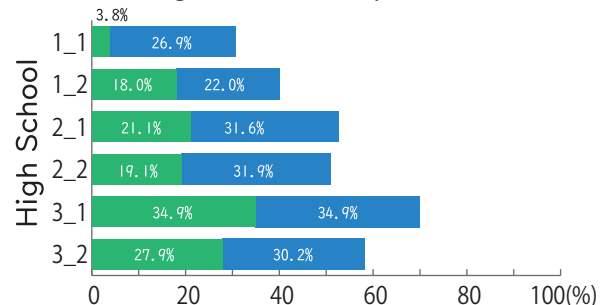
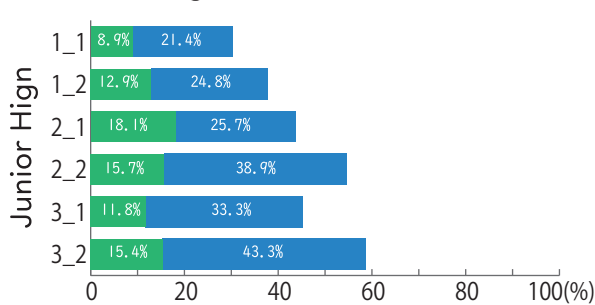
Measurement of Educational Effectiveness

Between 2021 and 2024, this program was implemented in junior high schools and high schools on the remote island of Tanegashima in Japan. Effect measurements of the educational impact of this program were conducted via surveys every six months for students in grades 1 through 3. A portion of these results is shown below. These results were published by Yatagawa & Kurishima (2024).

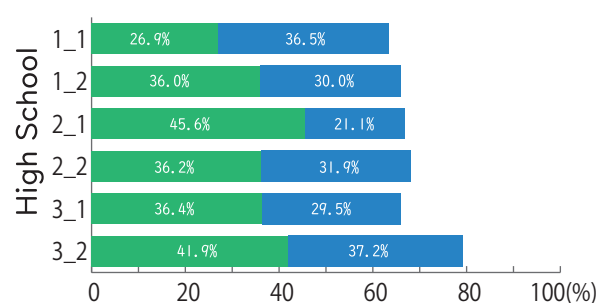
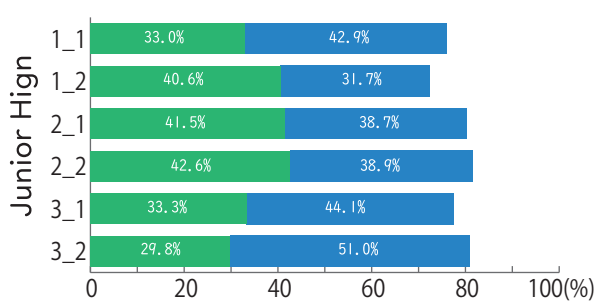
Q. I know about the term "Carbon Neutral"



Q. I have thought about how I will be involved with Tanegashima in my future.



Q. As a member of the community, I want to contribute to the community.



This program has led to an annual improvement in students' literacy skills and has prompted them to contemplate their future connection with both themselves and their community. However, as their awareness of contributing to their community was already high, it was challenging to fully assess the program's impact. Nevertheless, at the very least, their motivation for contributing to their community has been sustained.

Contact for this program



Laboratory for Local Human Resources and Career Education,
Research Center for Regional Co-creation Basis,
Shibaura Institute of Technology, Japan



TEL +81-3-5859-9072 / +81-48-720-6437

✉ kurikuri@shibaura-it.ac.jp / yatarumi@shibaura-it.ac.jp

<https://sit-kurumi-lab.org/>