



SUSTAINABILITY IN THE CURRICULUM

MERICI COLLEGE

MS REBECCA DE COURCY
SUSTAINABILITY OFFICER

Integrated Humanities

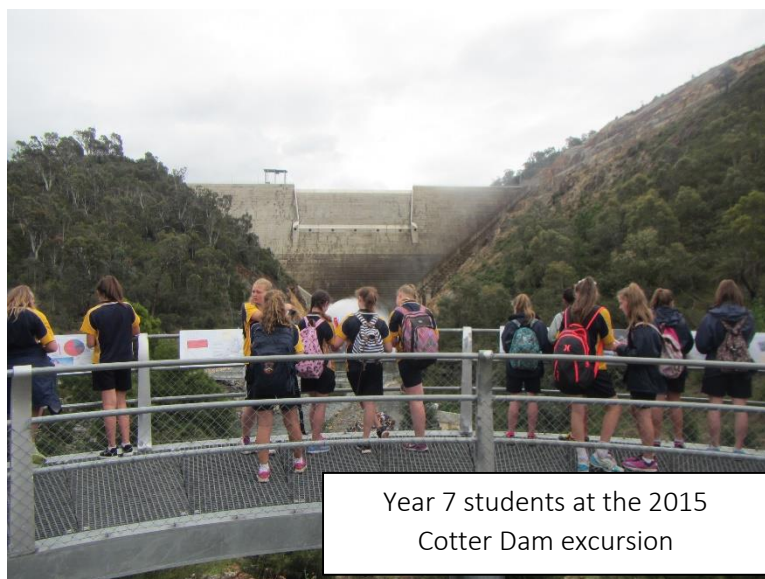
In Year 7, Merici students are taught Geography, History and English together within their 'Integrated Humanities' class. Within the Geography component, students learn about water scarcity and ways of overcoming it, and liveability and its associated environmental concepts.

While learning about water resources, the students have an excursion to the Cotter Dam precinct. On the excursion they are able to learn about water sources and experience firsthand the challenge of providing freshwater. Excursions previously have also included visiting the water-wise garden at the National Arboretum. The students look at issues with water availability in the Murray Darling Basin and in countries other than Australia such as Bangladesh.

While learning about liveability, the students study pollution and water quality. An assessment for the unit involves the students assessing the liveability of their neighbourhood. This allows the students to understand how their theoretical knowledge applies to real-world situations.

Within the History component, Year 7 students are exposed to sustainability-related learning in their analysis of Ancient cultures. With seven classes, three study Ancient Greece, two Egypt and two Rome. Students studying Ancient Egypt learn about how the Nile contributed to Ancient Egyptian civilisations through supporting agriculture, religion and culture, and transportation. Students studying Ancient Rome learn about the ways Romans managed water resources through technologies like aqueducts. Students studying Ancient Greece learn about what environmental factors led to settlement in certain places. The history component also covers white settlement in Australia, where students examine impacts on indigenous cultures and how society and environments changed. Students also learn about the Out of Africa theory.

The religion component covers a core unit focused on stewardship, which involves both a theoretical and a practical component. Students learn what it means to be a steward of the Earth while learning how to sow seeds and grow plants, identifying different plants in the garden, learning about the importance of soil and how to test it for different indicators of health, looking after chickens, weeding and discovering other areas outside the garden where the school has invested in sustainability. The students hear a presentation from Janet (a chef) and Joyce (an organic farmer), where they discuss how they act as stewards of the Earth in their professions.



Year 7 students at the 2015
Cotter Dam excursion

Science

The Science faculty at Merici has adopted the National Curriculum for Years 7 to 10, which has a strong focus on sustainability.

Year 7

Year 7 students are exposed to a range of sustainability-related learning themes. Within their study the students develop practical knowledge by participating in several excursions. The first is to the Australian Botanic Gardens, where students learn about indigenous plants and identifying them. There is also a walking excursion to the O'Connor wetlands, where students are exposed to Water Sensitive Urban Design, and conduct experiments on water quality.

Year 9

This year (2015), students in Year 9 participated in an ACARA STEM project which saw them investigate the efficiency of solar cells over a period of 10 weeks. This study improved students' understanding of energy production and particularly renewable energy sources. The students showed great enthusiasm for the project, and as such Merici has decided to offer Engineering as a year 9/10 elective in 2016.

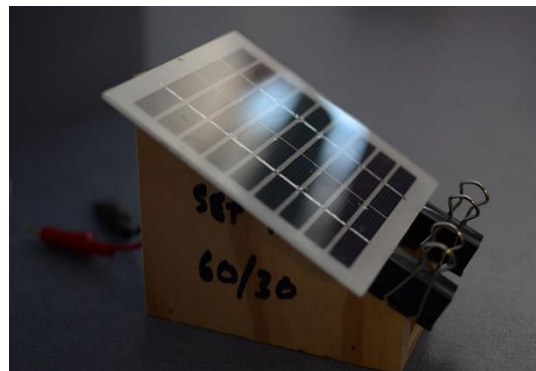
Senior: Years 11 & 12

In 2016, the current senior subject 'Earth Science' will change to 'Earth and Environmental Science'. Consequently, the subject will have a greater focus on sustainability. The broadening of the subject area will give the teachers of this subject future opportunities in sustainability-related Professional Development sessions.

Year 11 students studying Physics engage with sustainability in Physics Unit 2: 'Thermal, Nuclear and Electric'. The unit covers heat loss and transfer, nuclear energy production and the function and production of electricity. This study furthers students' understanding in the technicalities of energy production. As such, they are able to apply this knowledge to understanding more sustainable ways of producing energy.



Year 7 students identify native plants at the Botanic Gardens



Mini-solar panels used by the students in the STEM project

Sustainability Elective

In Years 9 and 10, Sustainability is offered as an elective to students. The elective is made up of roughly 50% theory and 50% practical, where the students assist the Sustainability teacher in the College's kitchen garden.

For each year group, the subject begins with an introduction to what sustainability is, an overview of climate change and global warming, and a mind-map exercise where each student writes what they know about sustainability.

Year 9

Year 9 students study two theory units: Food and Energy. In the Food module, students assess the carbon footprint of their diets, compare the emissions intensity of different types of foods, audit their homes for food waste, and go on an excursion to a local supermarket where they look at the practical workings of the food industry. In the Energy unit, students learn to calculate kilowatts and apply this knowledge to assess the energy efficiency of different appliances. They also learn about renewable and non-renewable ways of generating energy, take an energy audit of their homes, and listen to a guest speaker from WindLab talk about the renewable energy industry. In the practical component, students learn how to grow seedlings, garden maintenance, soil testing and improvement, harvesting, pests and diseases in gardens, composting, and chicken health and care. Students attend at least one excursion to an organic or biodynamic farm around the capital region. Year 9 students also grow tomatoes and run the annual tomato sale.

Year 10

Students in Year 10 study Consumption and Transport. In the consumption unit, students learn about the life cycle of products as presented in marketing, and then assess life cycles of other products from extraction to disposal. In the transport unit, students look at the emissions intensity from different forms of transport. They attend an excursion in Sydney where they have to organise in their own groups how to get from one point to another on at least three different forms of transport. Students also attend a lecture at UTS about sustainable transport and go to the Central One building which has a high environmental rating. In the practical component, students build on the content from the Year 9 course as well as pruning, direct seeding, and growing additional plants for the tomato sale like chillies and eggplants.



Year 10 students tend to seedlings



Year 9 students harvest potatoes at Ingelara



Students at the tomato sale

Geography

Year 8

In Year 8, students study Geography for one semester. In 'Landscapes and Landforms', students learn about environmental conditions in varying landscapes. For example, the conditions in deserts - both generally and in Australia specifically - including the adaptations of plant and animal life to a lack of water. Students also learn how coastal and riverine landscapes are sensitive to the presence and flow of water. The 'Changing Nations' module focuses on issues of human population growth, urbanisation and the concept of 'sustainable cities'. In this way the students are exposed to the problems associated with overcrowding and urbanisation as well as ways of mitigating these problems. In the fieldtrip component of the semester, students visit Tidbinbilla Nature Reserve and compare and contrast constructed, managed, and natural/ pristine elements of the landscape. The students are then assessed in-class on how each of these elements can be protected.

Year 9

In Year 9, students study Geography for one semester. In the Food Security module, students learn about the challenges of feeding the world, find out about patterns of food consumption, examine agriculture as an industry, and look at the production of rice and its importance to food markets globally. Assessment for this module requires the students to select a major food crop in Australia and research about it. The Global Connections module sees students learning about globalisation, including a lesson where students learn about where the products and services they use in their day-to-day life come from. The fieldtrip component of the course takes the students to Kosciuszko National Park, where they look at the effect of weather on landscapes, the national significance of the park in terms of its endemic flora and fauna, the history of land use in the park including indigenous use of land, and future management options in the park.

Year 10

In Year 10, students study Geography for one semester. They study 'Human Wellbeing' and 'Environmental Management'. In one lesson the students cover the concept of environmental footprint, in which they calculate their own through an online application. In this way, students are able to connect actions in their own lives to their impact on the environment. Overall, the module focuses on development and urban issues; particularly the provision of water in urban areas and associated issues, transport and Canberra as the 'bush capital'. In line with the focus on Canberra, the field trip component of the course sees students visiting various places in Canberra: Telstra Tower, Dickson/ Lyneham wetlands, Scrivener Dam, and Yarralumla. Within the 'Human Wellbeing' module, students cover poverty and inequality and examine consumption patterns in the West. This includes looking at excessive consumption such as huge weddings and enormous houses. This encourages students to think about the abnormality of Western consumption patterns, especially the disparity between this consumption and that in poorer countries.

Senior: Years 11 & 12

Within the Marine Geography module, senior students learn about land and water management issues in coastal environments, the fishing industry and stakeholders in coastal environments, ocean resources, the effect of climate change, and coastal processes such as erosion. Students take a field trip to the South Coast of NSW to study these issues in depth. Within the Environmental Hazards module, students learn about extreme weather events like fires, droughts, floods and avalanches, including the role of human actions in contributing to the risk of environmental hazards occurring.



Year 8 Geography students at
Tidbinbilla Nature Reserve



Year 9 Geography students at
Kosciuszko National Park



Year 10 Geography students at
Dickson Urban Wetland



Senior Geography students at the
NSW South Coast

History

Year 8

Students in Year 8 History focus on Medieval history. Within this unit, the students learn about the Black Death and how it spread through insufficient disease control measures like proper sanitation and clean water. Students also look at emerging urban centres in England, especially London, and the problems of higher density living including health risks.

Year 9

Students in Year 9 study the Industrial Revolution. Their study covers changes to transportation and agricultural systems, and they learn about how these changes affected the environment. Students investigate environmental impacts such as air pollution, water pollution, sewerage problems, industrial waste, and deforestation and land clearing. They consider the urbanisation that came along with industrialisation, and its impacts on human health and reduced resource availability of food and clean water. Year 9 students also learn about World War I, and the changing economies of countries in wartime due to scarce environmental resources including programs like rationing systems.

Year 10

Students in Year 10 study World War II and Post-war Australia 1945-1970. Their unit on Post-war Australia involves looking at changes in both technology and society. Within the unit, students are required to complete an oral presentation on a topic of their choice, and this year some students chose to research the Snowy Hydro Scheme, looking at its environmental costs and benefits as well as other factors. Other students looked at changes and advancements in transportation.

Senior: Years 11 and 12

In senior years, students studying Ancient History complete a unit on Ancient Rome, including problems of overpopulation and the associated struggles to provide adequate resources to all people. Briefly, the students look at environmental factors as a suggested reason for the fall of Rome. This material helps the students to engage with problems of resource scarcity and their prevalence across time and location, improving their understanding of such issues in the contemporary world. In the Modern History course, students study a unit on international diplomacy, including the role of the United Nations. Next year, this will include analysis of the UN's role in international environmental policy as an option for assessment. Another unit on Social Movements will see the students choosing between learning about women's liberation or the environmental movement. Other study in the Modern course concerns wars including the French Revolution, the American Civil War and WWII in Germany. During these units students learn about the pressures wartime exerts on resources, the role of unequal distribution of resources in sparking conflict, and the environmental destruction that war brings.

Food Technology and Hospitality

Food Technology is a mandatory subject for students in Year 7 who study the subject for one term. In year 8, it is an elective that students study for one semester. In Year 9, it is an elective students study for the full year. In Years 10, 11 and 12, the subject changes to the Hospitality elective. In Year 7, students learn about cooking local, seasonal produce and creating healthy meals such as salads. Recipes that the students learn are often meat-free. In Year 8, Food Technology students complete an 'Ethical Eating' module in which they study the environmental issues of food production, including food miles, sustainable and healthy diets across the world, meat eating, and differences between what their grandparents' diets were like and what theirs are like now. For the assignment, the students record all the food they've eaten in one day, break it down into ingredients, and create an adapted daily diet that is more seasonal, sustainable and healthy. The students also look at the Kitchen Garden and Canteen and plant their own zucchini seeds which they take home at the end of the semester. In Year 9, students study a module called 'Entertain me' in which they learn about planning, preparing and holding events. The students learn to focus on keeping their menus seasonal as this reduces costs and is more sustainable. In the Hospitality Elective, students in Year 10, 11 and 12 work in the Trades Training Centre (kitchen) where they use fresh, seasonal produce to make meals both for the canteen and for special Restaurant events which occur roughly twice per term. The students also learn to use produce from the Organic garden at the school. In their theory component, Hospitality students learn about food miles, seasonal cooking, and ways of making their workplace more sustainable in day-to-day operations – for example, conserving water through using an energy- and water-efficient dishwasher.



Year 11 Hospitality students
in the kitchen



Junior students learning how
to make brown rice salad



Healthy food faces made by
year 7 students

Global Studies Subjects

Textiles/ Fashion

Textiles is taught as an elective subject for students from Years 7 – 10. In senior years, the subject becomes Textiles and Fashion. Students studying Textiles learn sewing skills, where they use sewing machines in increasingly advanced applications. They learn about different kinds of fabric, patterns, colouring fabric, the origin of fabric fibres, historical uses of different types of fabrics and clothing, and aesthetic and functional features of design. Students make a variety of products, ranging from pillow cases to shirts. These skills allow the students to understand how to increase the longevity of their own clothing by mending it, and they get functional usage out of the products that they make. All fabrics used in textiles are recycled, with a lot of fabric donated to the department from parents and staff members. Offcuts are not disposed of but repurposed as samples. Patterns are always reused. In senior years, sustainability becomes a stronger focus as students look at fashion marketing and the ethics and environmental issues behind it, psychological and cultural factors in clothing, environmental impacts of colouration and dyeing, and ethical responsibilities of designers. Senior students complete a major unit on costuming, in which a lot of materials used are recycled (for example, curtains!).

Consumer Education

Consumer Education is an elective for students in Years 9 and 10. Units include ‘Clever Consumers’ where students look at the efficient use of resources such as packaging, learn about advertising including green labelling and poor labelling, and also analyse the distribution of resources. In this way, the course helps students to be conscious of the products they consume, including their environmental attributes and costs, and accordingly how to consume in a more sustainable way.

Information Technology (IT)

IT is offered as an elective in Year 8 and Year 9, as well as a senior elective for Year 11 and 12 students. Because IT is taught as a Vocational Education and Training (VET) course to seniors, students learn about sustainable work practices within this subject. Specifically, senior students learn about how to identify resource use in the workplace, including efficiency, energy usage and waste issues; identify environmental hazards in the workplace; and to improve their workplace towards a more sustainable end.

Students studying IT engage with the concept of recycling their e-waste. The disposal of old electronics, including IT equipment, continues to be a significant environmental problem and students are encouraged to recycle theirs.



Physical Education, Health and Behavioural Science (PHABS)

Year 7

In Year 7, students study two units within their PHABS subject: Growth and development ('Who am I?') and Health and Fitness. Within the Health and Fitness unit, students discuss ways of having a healthy lifestyle, and learn about how to increase fitness and health in commuting. They consider cycling, walking and catching the bus as alternatives to driving or getting dropped off in the car.

Year 8

In Year 8, students learn about Healthy Self-Image and Development. This includes healthy decision-making, resilience and wellbeing, and food and diet. While resilience is studied with relation to human specifically, students can apply this understanding of the concept of resilience to natural systems. Within the food and diet module, students study the food guide for healthy eating, benefits of healthy eating for physical and mental health, and the negatives of poor diets and unhealthy foods. In this way, students gain an understanding of how to improve their diet and substitute unhealthy, unsustainable foods for healthy and fresh food which have a lesser environmental impact. Furthermore, this increases their understanding of diets and lifestyles that are sustainable for their bodies.

Year 9 & 10

In Years 9 and 10, students study four units to complete their compulsory PHABS subject. One of these units is Food and Nutrition, studied for one semester. Within this unit students learn about the requirements of a healthy diet for adolescents, different influences on food choices, the provision of important micronutrients from fresh, healthy foods like vegetables, and the impact of poor nutritional choices on the community level.

Senior: Years 11 & 12

In the electives of Sociology and Psychology, senior students consider the values, norms and emotions that influence the behaviour of individuals and of societies at large. Encouraged to think critically about these influences, students can apply their analysis of cultural norms to understandings of sustainability-related social constructions. For example, conservation or consumerism. In the Sport and Recreation elective, senior students learn about managing recreation programs. Students organise health and fitness-related events in the school community like sports gala days and carnivals. By so doing, students learn about ways of engaging their peers and community members to get involved in events that improve their physical and social health. Students also complete a Fitness unit, where they learn about ways of enhancing fitness in individuals, leading them to more positive and sustainable lifestyles.



Sociology students visit a rooftop garden



All students get involved in the Athletics Carnival

Expressive Arts: Visual Art, Drama, Dance, Music, Photography and Media

Within the Expressive Arts department, staff are actively digitising their lessons as much as possible to reduce unnecessary paper use.

Visual Art

Visual Art is mandatory for Year 7 students and an elective for students in higher years. Sustainability is integrated within the subject as a behavioural element of learning rather than something that is taught explicitly in classes. For example, students across different year groups constantly use recycled materials in their artwork. These include materials from within other parts of the school like the IT department and materials donated by external parties such as old maps and scrap metal parts. Within the department there is a strong focus on reuse, which also includes reusing old canvases. This allows the students to learn that pre-used materials can be functional in another use, and also enhances a deeper understanding of the creativity of living a more sustainable lifestyle.

Students actively use the three-bin recycling system in the Art department, which helps them understand how to properly separate waste in other areas around the school.

Photography

Photography is taught as a senior subject to students in Year 11 & 12. Within the subject, students actively manage their own resource use and are encouraged to use paper and ink efficiently and frugally. Students dispose of used ink cartridges in a Planet Ark box, which gets sent to Planet Ark at the end of every semester for recycling. Similarly to Visual Art, sustainability is taught as a behaviour rather than as theory, and in this way gives the students practical skills that they can apply in their lives outside the classroom.

Dance

In 2015, students in Year 11 Dance were for the first time assessed on choreography based on an environmental issue. The students were asked to research an environmental issue they found interesting, choreograph a dance about the issue, and perform that dance. Students chose topics like deforestation and oil spills. This topic allowed students to engage with sustainability in an artistic way and on an emotional level.



Religious Education

Teachers in the RE Department are actively digitising their assessment policy, so that now assessments are all uploaded onto Moodle and never distributed in hard copy. Furthermore, staff are incorporating sustainability into their professional development. For example, one staff member had a focus on sustainability in her lessons as a goal for the 2015 academic year.

Year 8

During Year Eight, students conduct a community service requirement as a part of the College's 'Serviam' (Latin for 'I will serve') program. This year, Year 8 students have focussed specifically on community service related to sustainability. In their Religion classes, students collected litter from around the school grounds. The students were aware that this mitigated threats to the environment, like animals ingesting harmful waste like plastics, as well as preventing problems for local soil and water quality.

Year 9 and 10

In Years 9 and 10, students studying Religion have a unit on 'World Religions', where they learn about religions other than Christianity and consider alternative values and worldviews. This helps with the students' understanding of the multi-faceted nature of sustainability. For example, learning about other religions helps students understand that different cultural and spiritual beliefs may lead to very diverse perspectives on nature and the environment. Students in year 9 also have the option of working with graduate students from Black Mountain School, who complete work experience at Merici. The Merici students help and guide the Black Mountain students to complete day-to-day tasks at the College including work in the garden.

Senior (Year 11 and 12)

In Year 11 RE is compulsory and in Year 12 it is an elective. Year 11 students study a unit on Ethics, which in 2015 was concentrated on Environmental Ethics. The 2015 release of Pope Francis' Encyclical *Laudato Si'* gave a strong foundation to the unit. Students were required to research an example of where ethical problems emerged in relation to an environmental issue, covering issues like palm oil plantations and overfishing. Students were encouraged to think about the responsibilities of businesses and large corporations in situations of environmental exploitation, as well as the negative effects on people most vulnerable. In Year 12, students study a Social Justice unit. This unit involves looking at Indigenous communities in Australia, including their lifestyles and issues they have in the contemporary world. Students learn about their unique relationship with the environment, their respect for nature, the way they utilise the land to sustain themselves in the long term, and their use of fishing.

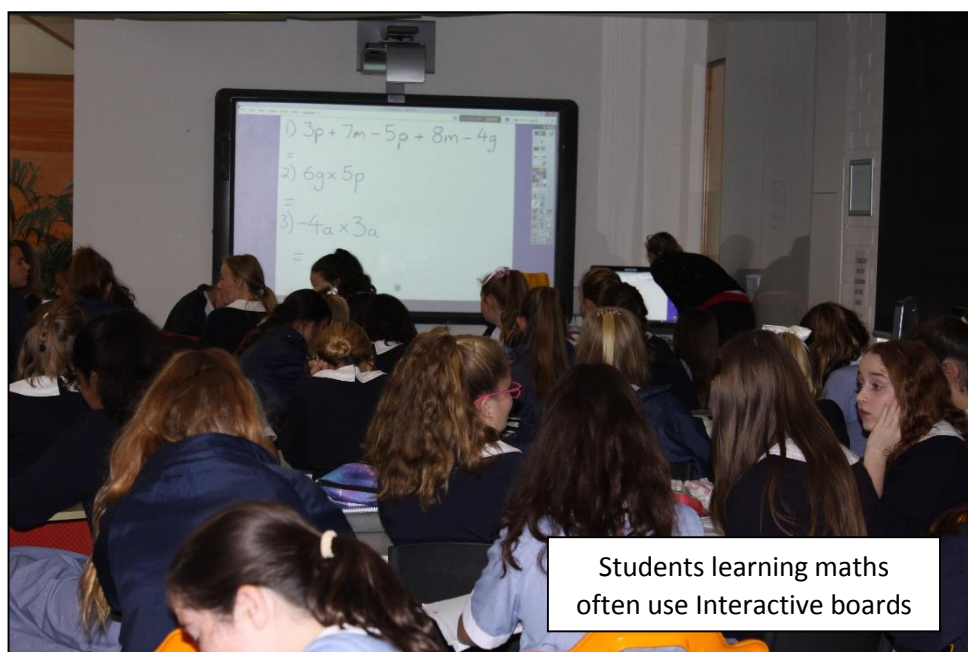


Year 9 students with Black Mountain students

Mathematics

Students at Merici College study Mathematics as a compulsory subject from Year 7-10 and as an elective in Years 11 and 12. The department follows the ACARA National Curriculum, which has no specifications for sustainability-related units. However, the department has participated, along with the Science Department, in running two combined STEM classes this year which had a sustainability focus. This involved students conducting a project on solar cells. In their maths class, they learnt the necessary skills that they applied to their project in their Science Class. For example, estimating the size of the sun and its distance from Earth using mathematical skills such as trigonometry.

The skills students learn in mathematics can be applied to analysis in sustainability-related problems to produce solutions. Accordingly, the department is looking into using more contextual examples that the students can apply their mathematical skills to in class. These include measuring the area and volume of waste produced in the school, extrapolating from calibration figures to find how much water the school uses for paper consumption, and more generally collecting, organising, interpreting and representing data related to sustainability.



Languages

Languages offered at Merici include French, Italian, Chinese and Japanese. Students choose one of these languages in Year 7 to study until the end of year 8. From Year 9, languages become elective. In senior years, Japanese and Chinese are offered in both continuing and beginning streams, while French and Italian are offered in continuing streams only. In junior years, sustainability is not a specific focus of curricula in languages but topics relating to sustainability often become relevant. For example, junior students studying Chinese do a unit on transport, and this year the class looked at the negative environmental effects of increasing private transport and the government's response. More generally, students are constantly comparing and contrasting culture in Australia to that in their target culture, and this can involve analysis of environmental issues. For example, junior Italian students recently watched a documentary about the waste problem in Naples and considered how this compared to waste collection in Australia. In senior years, sustainability is a specific focus in all languages as students study the Worldwide Issues unit. Within this unit, they study *Our Changing Planet* and *Environmental Issues*, where they look at problems of water, electricity usage, and waste globally and how Merici's school policies address these issues. Students have the opportunity to go on study tours, where each language holds a tour roughly once every two years. On these tours, students directly engage in other cultures, including their environmental management practices.



Senior languages students on an excursion



Japanese students on the 2015 Japan Study Tour