



**SUSTAINABILITY
IN THE SCIENCE
CURRICULUM**

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OVERVIEW

Sustainability in the Curriculum at The University of Melbourne

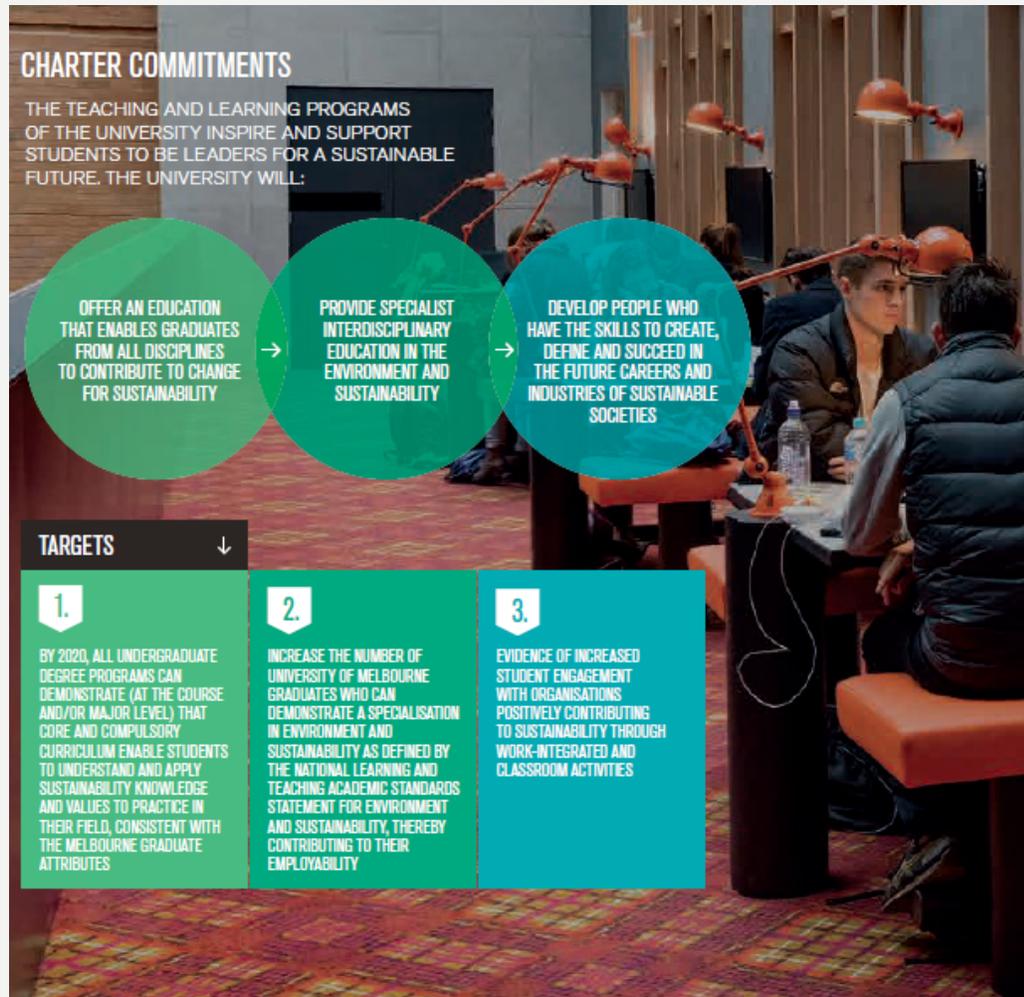
Sustainability in the Science Curriculum at The University of Melbourne

The University of Melbourne Sustainability Charter(2016)

- Establishes principles and commits the University to action for sustainability in research, teaching and learning, operations, management and leadership
- “The teaching and learning programs of the University inspire and support students to be leaders for a sustainable future”

The University of Melbourne Sustainability Plan 2017-2020

- Identifies priority actions and targets to meet the commitments of the Sustainability Charter
- T&L targets relating to:
 - Sustainability knowledge and values in all fields
 - Specialist education in sustainability
 - Engagement in industries of sustainable society



LEARNING OUTCOME	EXPLANATION	EXAMPLES
KNOWLEDGE AND INTEGRATION	Deep and integrative knowledge of how the field of study relates to welfare of environment and society	Medical students draw on concepts from the multidisciplinary field of Ecohealth to understand the connections between physical environments and human health
EVALUATE AND ANTICIPATE CHANGE	Capacity to evaluate and anticipate the forces and dynamics of social and environmental change	Physics students develop skills in estimation and exponentiation and apply these to problems of environmental change
ACT FOR POSITIVE CHANGE	Capacity to apply and promote environmentally and socially responsible practices in professional life and citizenship	Management students utilise corporate social responsibility frameworks to guide more ethical business practices

Sustainability Fellows

Faculty specific programs of work:

- Discovery process/audit and 'starting the conversation'
- Diverse interventions including:
 - New core subjects with sustainability focus
 - Enhancing focus on SDGs in existing subjects
 - Enhancing continuity of sustainability themes across subjects
 - Building opportunities for global citizenship within core teaching
 - Enhancing co-curricular opportunities
 - Enhancing opportunities for professional development and communities of practice

SUSTAINABILITY IN THE SCIENCE CURRICULUM: **DISCOVERY PROCESS**

- Identify where and how sustainability already exists in undergraduate curricula of BSc.
- Provoke reflection, idea generation and identify people who are keen to work toward this goal
- Conversations with staff and students from 10 majors of B Sc
- Conversations focused by exploration of UniMelb sustainability learning outcomes:
 - Deep and integrative knowledge of how the field of study relates to welfare of environment and society
 - Capacity to evaluate and anticipate the forces and dynamics of social and environmental change
 - Capacity to apply and promote environmentally and socially responsible practices in professional life and citizenship

KNOWLEDGE AND INTEGRATION

Understanding of how field of study relates to welfare of environment and society

Varied across majors

- Explicit integration: e.g. Geography, Ecosystem Science, Environmental Science
- Partial integration: e.g. Geology links disciplinary knowledge to welfare of environment, but not society
- Limited integration: e.g. used to establish relevance of Maths and Statistics and Physics but not taught or assessed

EVALUATE AND ANTICIPATE CHANGE

Capacity to anticipate forces and dynamics of social and environmental change

- Skill is a core concern (taught and assessed) of all majors but variable application to sustainability challenges
 - Explicit application to environmental and social challenges: e.g. Zoology, Ecology and Evolutionary Biology
 - Able to suggest ways application skills could be further developed: e.g. Genetics, Maths and Statistics, Chemistry, Physics

ACT FOR POSITIVE CHANGE

Capacity to promote environmentally and socially responsible practice

- All majors highlighted contributions of science graduates to sustainability through good scientific practice (safe, critical, truthful, open).
- Additionally it can involve:
 - Responsible activity in laboratory contexts (e.g. Chemistry);
 - Critique of societal and professional norms and practices (e.g. Geography);
 - Proposing sustainable (policy or planning) responses to social and environmental challenges (e.g. Ecosystem Sciences)

ENABLERS AND BARRIERS

- *Text books* – may or may not have examples relevant to sustainability
- *Problems and case studies* – resources to set learning activities in which students apply basic concepts to sustainability issues may or may not exist
- *Informal curriculum* – scope to interact with peers and teaching staff in ways that mean students get a rounded picture of a responsible scientist in their field (including through laboratory and field work)
- *Professional societies* – may or may not support consideration of sustainability within the field

SUSTAINABILITY IN THE SCIENCE CURRICULUM: **PLANNING**

- Core curriculum for Bachelor of Science – *in development for delivery 2022*
 - First year subject: Today's Science, Tomorrow's World
 - Core materials and modules to explore and apply to sustainability and climate change challenges

SUSTAINABILITY IN THE SCIENCE CURRICULUM: **PLANNING**

- Supporting majors to better incorporate sustainability in curriculum
 - Identifying opportunities to build on Today's Science, Tomorrow's World with majors
 - Resourcing development of sustainability problems and cases
 - Promoting opportunities for experiential learning linked to subject curricula