



Face Mask
Challenges 2.0



UOW
**MAKER
SPACE**

presents

The Face Mask Challenges

The UOW Makerspace annual school design challenges have been designed by the UOW Makerspace Team as part of the Global Challenges Future Makers project.

The Future Makers project investigates how Makerspaces can impact and contribute to the local economy as a stimulus for new business generation and STEM education. These challenges aim to encourage interest in STEM in our community, enhancing educational opportunities and improving outcomes.

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Context for The Challenges

Face masks have become commonplace in our lives due to the ongoing COVID-19 pandemic as an important measure to keep ourselves and communities safe by slowing the spread of airborne transmissions. While we have received lots of public health information on their use, there has been little guidance regarding safe disposal or recycling.

Disposable masks are often seen as more hygienic and convenient; however, their long-term impacts are anything but! These are often made from long-lasting plastic materials which do not break down in the environment for many, many decades. Even more frightening, viruses can survive on these materials for seven days under certain conditions causing issues for those trying to clean and recycle these products.

This leads us to question whether these disposable, single-use options are really the best choice for our personal protection.

This year's UOW Makerspace design challenge encourages students to investigate this environmental issue and work together to design a range of accessible solutions. There are a range of investigations as well as design tasks to explore the issues associated with single-use masks, recycling processes and alternative choices for both primary and secondary students.

Stimulus videos:

- **OneArmy – 30 BILLION FACEMASKS and what you could do with them**
A video exploring different recycling processes and materials that can be made from disposable masks
https://www.youtube.com/watch?v=Y5pkleCwb_Y
- **Plaxtil – Face mask recycling**
A French company's approach to reusing COVID waste
<https://www.youtube.com/watch?v=z1fAh1gE57w>
- **Beach Guardian – The rising tide of PPE pollution**
UK short film on beach pollution in the wake of COVID
<https://www.youtube.com/watch?v=O2PJXK4AmsU>

Research articles:

- **What we need to know about PPE associated with the COVID-19 pandemic in the marine environment (Feb, 2021) by De-la-Torre and Aragaw**
<https://doi.org/10.1016/j.marpolbul.2020.111879>
- **Protecting the environment from plastic PPE (Jan, 2021) by Zhang, Aitchison, Phillips, Shaban and Kam**
https://www.researchgate.net/profile/Andrew-Kam/publication/348610715_Protecting_the_environment_from_plastic_PPE/links/60096cbc45851553a05c1142/Protecting-the-environment-from-plastic-PPE.pdf
- **PPE: Polluting planet earth (Sept, 2020) by Dean**
<https://www.nature.com/articles/s41415-020-2130-5#citeas>

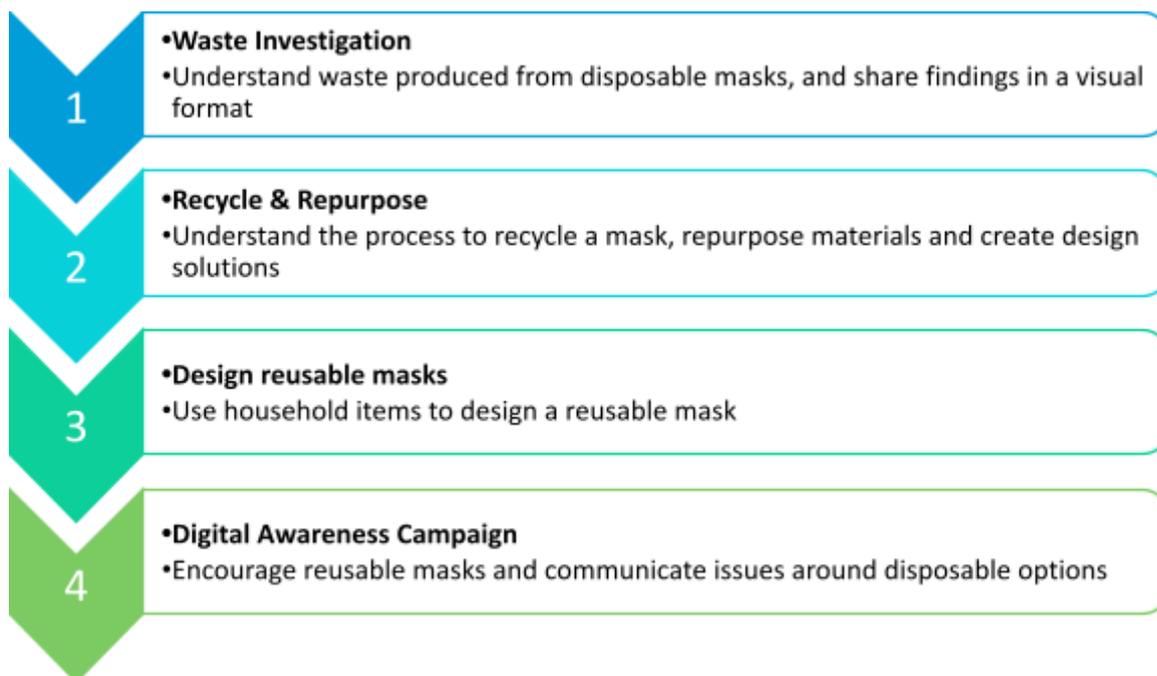
The Challenges: An Overview

Designed for Stages 2-5.

These challenges have curriculum links for primary and secondary students, with differentiation available throughout to meet the needs of students.

The UOW Makerspace has set out the following challenges for students in Stages 2, 3, 4 and 5 to support the development of STEM knowledges in response to pollution, recycling and repurposing associated with disposable face masks. We encourage teachers to choose one or all of the challenges. You could even use a jigsaw approach and assign small groups to different challenges.

Learning Intentions: Students will learn about the pollution and waste issues associated with disposable face masks and other COVID-19 related medical waste. Students will also investigate recycling processes for medical waste and face masks, considering their own process and uses for the recycled material. Students will also experiment with designs for reusable face masks, using materials available in their homes to develop new products. In the final challenge, students will use their developed knowledge to create a digital awareness campaign suited for their age group that explores these issues and presents solutions.



Target Topics, Ideas and Focus Areas: sustainability, recycling, pollution, reuse, repurposing, innovation, design and production

Driving Questions: What happens to our face mask waste? Can face masks be recycled? What other sustainable options are there for face masks and personal protective equipment? How can we communicate the need to others for more sustainable options?

The Challenges: Submission Information

In 2021, the UOW Makerspace challenges have both a primary and secondary category. Each category will have its own winner for each of the challenges, and students can work either individually, in teams or in class groups to attempt and complete their submissions.

Each challenge description has specific details about the format required for submission, however feel free to contact the team if you require more information or have any questions (makerspace@uow.edu.au or clairer@uow.edu.au).

Use the Google Form to submit your response to any of the challenges; this will ask for details about the category and type of challenge attempted, as well as contact details so we can notify winners and distribute certificates. A media release is also included on this form, requesting permission to share submissions on our website and social media pages, so please indicate whether or not you agree to this on the form.

Submission Form: <https://forms.gle/j1M2RKT2sDM8nbJ88>

If you have any further questions about the challenges, your implementation or submission guidelines, please contact clairer@uow.edu.au

The Curriculum Connections: An Overview

Below is a summarised table of curriculum links and outcomes relating to each challenge. Further details and descriptors have been provided following each challenge.

Australian Curriculum:

Challenge	Purpose	KLA Outcomes (Australian Curriculum)		Cross Curriculum Priorities	General Capabilities
Waste Investigation	Understand waste produced, and share findings in a visual form	Stage 2: ACSIS064, ACSIS071	Stage 3: ACSIS110, ACSIS232	Sustainability OI.6, OI.7, OI.8, OI.9	Critical & Creative Thinking, ICT, Literacy
		Stage 4: ACSIS148	Stage 5: ACSIS208		
Recycle & Repurpose	Reuse materials in used masks for new purposes	Stage 2: ACSIS065, ACTDEP015, ACTDEP016	Stage 3: ACSIS103, ACTDEP025, ACTDEP026		
		Stage 4: ACSHE135, ACTDEK034, ACTDEP036, ACTDEP037	Stage 5: ACHE230, ACSIS199, ACTDEK046, ACTDEP049		
Design Reusable Masks	Using common household items to design a reusable mask	Stage 2: ACTDEK013, ACSSU074, ACTDDEP016	Stage 3: ACSSU095, ACTDEK023, ACTDEP026		
		Stage 4: ACSIS065, ACSSU074, ACTDEP035, ACTDEP037	Stage 5: ASSU095, ACSIS103, ACTDEK046, ACTDEP049		
Digital Awareness Campaign	Digital awareness campaign for reusable masks	Stage 2: ACTDIP013, ACELA1793	Stage 3: ACELY1714, ACTDIP022		
		Stage 4: ACTDIP032, ACELY1808	Stage 5: ACELY1776, ACELY1776		

NSW Syllabus:

Challenge	Purpose	KLA Outcomes (NSW Curriculum)		Cross Curriculum Priorities	General Capabilities
Waste Investigation	Understand waste produced, and share findings in a visual form	Stage 2: 1VA, 16P	Stage 3: 1VA, 16P	Sustainability	Critical & Creative Thinking, ICT, Literacy
		Stage 4: 1VA, 7WS, 9WS, 4.2.2	Stage 5: 1VA, 7WS, 9WS, 5.2.2		
Recycle & Repurpose	Reuse materials in used masks for new purposes	Stage 2: 1WS-S, 2VA, 2DP-T, 5WT, 13MW	Stage 3: 1WS-S, 2VA, 5WT, 13MW		
		Stage 4: 2VA, 8WS, 4.1.1, 4.2.1, 4.3.1, 4.6.2, DT4-5, DT4-6, DT4-10	Stage 5: 2VA, 8WS, DT5-2, DT5-6, DT5-10		
Design Reusable Masks	Using common household items to design a reusable mask	Stage 2: 1WS-S, 4WS, 2DP-T, 5WT, 13MW	Stage 3: 1WS-S, 4WS, 2DP-T, 5WT, 13MW		
		Stage 4: 8WS, DT4-5, DT4-6, DT4-10, 4.1.1, 4.2.1, 4.3.1, 4.6.2	Stage 5: 8WS, DT5-2, DT5-6, DT5-10		
Digital Awareness Campaign	Digital awareness campaign for reusable masks	Stage 2: 3VA	Stage 3: 3VA		
		Stage 4: 9WS, 4.2.2	Stage 5: 7WS, 9WS		

Challenge 1: Waste Investigation

Since the COVID-19 pandemic, the use of face masks to protect ourselves against airborne viruses has become a necessity. While there are reusable face mask options, many people still rely on disposable, single-use masks due to convenience, hygiene and availability. This has led to a build-up of mask-related waste which we did not necessarily have prior to the pandemic.

To begin this challenge, conduct an investigation into the waste produced from disposable masks and other COVID-19 related medical products. You can use the following questions to start your thinking;

- How can masks be disposed of hygienically?
- What happens to masks when they are thrown out?
- How much waste are we actually producing?
- What can be done with masks after they are used?
- Can disposable masks be recycled?

You might like to start with some of the links below;

- **The Guardian: 'More masks than jellyfish' (June, 2020)**
A discussion of plastic and medical waste accumulating in the environment as a result of COVID-19
<https://www.theguardian.com/environment/2020/jun/08/more-masks-than-jellyfish-coronavirus-waste-ends-up-in-ocean>
- **ScienceMag: Accumulation of plastic waste during COVID-19 (Sept, 2020)**
Medical waste pollution issues from a scientific perspective
<https://science.sciencemag.org/content/369/6509/1314>
- **Science Daily: Preventing the next plastic problem (March, 2021)**
A scientific look into mask waste, recycling and plastic pollution in light of COVID-19
<https://www.sciencedaily.com/releases/2021/03/210310122431.htm>

Collect facts from your investigation to develop a poster or other visual product that explores and explains your findings. You could use a digital design tool such as Canva or photoshop, or develop a physical product. These posters should be designed to help students at your school understand the bigger issues behind mask waste and offer ideas of how they could help. When creating your poster, consider how you can clearly communicate your findings to your school community and integrate research to support your ideas. You might like to include things like diagrams, images or tables to further help explain your points.

Share your findings and posts with the UOW Makerspace using the hashtags #UOWmakerspace #UOWmakerspacechallenges. The winning teams/schools will have their posters shared on UOW Makerspace social media platforms and attend a UOW Makerspace excursion (virtual or face-to-face).

All entrants will also receive a certificate of participation for their work on this community-based challenge

Links and Outcomes - Primary

Challenge 1: Waste Investigation			
		Stage 2 – Years 3 and 4	Stage 3 – Years 5 and 6
<u>Outcomes</u>		<p>AC SIS064 – With guidance, identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge</p> <p>AC SIS071 – Represent and communicate observations, ideas and findings using formal and informal representations</p>	<p>AC SIS232 – With guidance, pose clarifying questions and make predictions about scientific investigations</p> <p>AC SIS110 – Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts</p>
<u>Cross Curriculum Priorities</u>		<p>OI.8 - Designing action for sustainability requires an evaluation of past practices, the assessment of scientific and technological developments, and balanced judgements based on projected future economic, social and environmental impacts.</p> <p>OI.9 Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.</p>	
<u>Sustainability</u>			
G e n e r a l C a p a b i l i t i e s	<i>Identify and clarify information and ideas</i>		
	Critical and Creative Thinking > Identifying, exploring and organizing information and ideas	Identify main ideas and select and clarify information from a range of sources	Identify and clarify relevant information and prioritise ideas
	<i>Locate, generate and access data and information</i>		
	Information and Communication Technologies > Investigating with ICT	Locate, retrieve or generate information from a range of digital sources	Locate, retrieve or generate information using search engines and simple search functions and classify information in meaningful ways
	<i>Compose spoken, written, visual and multimodal texts</i>		
	Literacy > Composing texts through speaking, writing and creating	Compose and edit a range of learning area texts	Compose and edit learning area texts

Links and Outcomes - Secondary

Challenge 1: Waste Investigation			
		Stage 4 – Years 7 and 8	Stage 5 – Years 9 and 10
<u>Outcomes</u>		ACSIS148 – Communicate ideas, findings and evidence-based solutions to problems using scientific language, and representations, using digital technologies as appropriate	ACSIS208 – Communicate scientific ideas and information for a specific purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations
<u>Cross Curriculum Priorities</u> <u>Sustainability</u>		<p>OI.8 - Designing action for sustainability requires an evaluation of past practices, the assessment of scientific and technological developments, and balanced judgements based on projected future economic, social and environmental impacts.</p> <p>OI.9 Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.</p>	
G e n e r a l C a p a b i l i t i e s	<i>Identify and clarify information and ideas</i>		
	Critical and Creative Thinking > Identifying, exploring and organizing information and ideas	Clarify information and ideas from texts or images when exploring challenging issues	Clarify complex information and ideas drawn from a range of sources
	<i>Locate, generate and access data and information</i>		
	Information and Communication Technologies > Investigating with ICT	Locate, retrieve or generate information using facilities and organize information in meaningful ways	Use advanced search tools and techniques or simulations and digital models to locate or generate precise data and information that supports the development of new understandings
	<i>Compose spoken, written, visual and multimodal texts</i>		
	Literacy > Composing texts through speaking, writing and creating	Compose and edit longer sustained learning area texts	Compose and edit longer and more complex learning area texts

Challenge 2: Recycle & Repurpose

There is an abundance of mask-waste as a result of the COVID-19 pandemic. Due to the nature of the virus, much of this waste is discarded with issues surrounding the safe, hygienic recycling and repurposing of materials. However, there are ways that this waste can be made safe and/or recycled through various processes. This opens up possibilities for reusing the materials from disposable masks in innovative ways.

This challenge requires you to consider a recycling process for disposable masks, and how the materials can be repurposed in new products. It is important to keep in mind hygiene practices here, so consider how the material could be treated to make it safe for its new purpose. You might like to investigate various methods used to recycle other types of medical waste and consider how this could be applied to your plan. To begin this challenge, you might like to start by viewing some recycling processes below;

- **OneArmy – 30 BILLION FACEMASKS and what you could do with them**
A video exploring different recycling processes and materials that can be made from disposable masks
https://www.youtube.com/watch?v=Y5pkleCwb_Y
- **TerraCycle – Zero Waste Box**
A recycling company offering return-postage-paid receptacles for recycling different PPE equipment
https://zerowasteboxes.terracycle.com.au/collections/personal-protective-equipment?utm_source=TC&utm_medium=carousel&utm_campaign=ppe_mask_recycling
- **Face masks: New solutions to reduce their negative impact on the environment**
A discussion of various companies who are attempting to recycle and repurpose waste from disposable face masks.
<https://emag.medicalexpo.com/face-masks-new-solutions-to-reduce-their-negative-impact-on-the-environment/>

Completing the Challenge:

You will need to design a process to recycle face masks. You can use elements of existing designs, or develop your own approach but should provide an outline of your process – this might include diagrams, flow-charts, descriptions or other means to explain your ideas. You might like to physically develop this process to demonstrate how it could be used to recycle face masks, and are encouraged to take photos and videos to share to support your submission. Alternatively, you might like to conceptualise (think-up) a process, and plan the steps and materials it would need to be developed and provide these plans with your submission. This process will impact the material that is produced, so you should provide some suggestions for how the recycled material can be used or repurposed.

Submission:

Your submission for this challenge should take the form of a 'Process and Product Portfolio', which should include your ideas for a process to recycle face masks, and what could be made with the material produced. You might like to use word processing (paragraphs/sentences), photographs/videos and handwritten elements (eg diagrams, flow-charts, drawings) to explain your ideas. Submit your response using the form (<https://forms.gle/j1M2RKT2sDM8nbJ88>) and share your findings and posts with the UOW Makerspace using the hashtags #UOWmakerspace #UOWmakerspacechallenges. The winning teams/schools will have elements of their portfolios shared on UOW Makerspace social media platforms and attend a UOW Makerspace excursion (virtual or face-to-face). All entrants will also receive a certificate of participation for their work on this community-based challenge

Links and Outcomes - Primary

Challenge 2: Process & Product			
		Stage 2 – Years 3 and 4	Stage 3 – Years 5 and 6
<u>Outcomes</u>		<p>ACSI065 – With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate materials and equipment</p> <p>ACTDEP015 – Generate, develop, and communicate design ideas and decisions using appropriate technical terms and graphical representation techniques</p> <p>ACTDEP016 – Select and use materials, components, tools, equipment and techniques and use safe work practices to make designed solutions</p>	<p>ACSHE103 – Identify, plan and apply the elements of scientific investigations to answer questions and solve problems using equipment and materials safely and identifying potential risks</p> <p>ACTDEP025 – Generate, develop and communicate design ideas and processes for audiences using appropriate technical terms and graphical representation techniques</p> <p>ACTDEP026 – Select appropriate materials, components, tools, equipment and techniques and apply safe procedures to make designed solutions</p>
<u>Cross Curriculum Priorities</u> <u>Sustainability</u>		<p>OI.7 – Actions for a more sustainable future reflect values of care, respect and responsibility and require us to explore and understand environments</p> <p>OI.8 - Designing action for sustainability requires an evaluation of past practices, the assessment of scientific and technological developments, and balanced judgements based on projected future economic, social and environmental impacts.</p> <p>OI.9 Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.</p>	
G e n e r a l C a p a b i l i t i e s	Critical and Creative Thinking > Generating ideas, possibilities and actions	<i>Imagine possibilities and connect ideas</i>	
		Expand on known ideas to create new and imaginative combinations	Combine ideas in a variety of ways and from a range of sources to create new possibilities
		<i>Seek solutions and put ideas into action</i>	
		Experiment with a range of options when seeking solutions and to put ideas into action	Assess and test options to identify the most effective solution and to put ideas into action

Links and Outcomes - Secondary

Challenge 2: Process & Product					
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G e n e r a l C a p a b i l i t i e s	<i>Imagine possibilities and connect ideas</i>				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 50%;">Draw parallels between known and new ideas to create new ways of achieving goals</td> <td style="width: 50%;">Create and connect complex ideas using imagery, analogies and symbolism</td> </tr> </tbody> </table>	Draw parallels between known and new ideas to create new ways of achieving goals	Create and connect complex ideas using imagery, analogies and symbolism		
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<i>Seek solutions and put ideas into action</i>					
Critical and Creative Thinking > Generating ideas, possibilities and actions	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 50%;">Predict possibilities and identify and test consequences when seeking solutions and putting ideas into action</td> <td style="width: 50%;">Assess risks and explain contingencies, taking account of a range of perspectives when seeking solutions and putting complex ideas into action</td> </tr> </tbody> </table>	Predict possibilities and identify and test consequences when seeking solutions and putting ideas into action	Assess risks and explain contingencies, taking account of a range of perspectives when seeking solutions and putting complex ideas into action		
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Challenge 3: Reusable Masks from Household Materials

There is an increasing need to find sustainable, reusable options for personal protective equipment such as face masks, with disposable options linked with pollution and recycling issues. As so many of us are spending more time in our homes, people are finding innovative ways to repurpose materials for new uses, particularly in response to the COVID-19 pandemic.

Can you make a safe, effective face mask from materials around your home? What sort of materials are needed to make a face mask? What materials are accessible?

This challenge requires you to design and create a face mask from materials you can find in your house. This mask should be reusable, meaning it can be cleaned or disinfected between uses so it can protect the wearer effectively every time.

You might like to start by getting some inspiration from these links;

- **Time Out: How to make your own no-sew face masks from everyday items**
A collection of four videos and explanations on different face mask designs and materials
<https://www.timeout.com/melbourne/news/how-to-make-your-own-no-sew-face-masks-from-everyday-items-071320>
- **Sarah Maker: 5 ways to make a no-sew face mask with household materials**
Explains fabric choice and different approaches for at-home face masks
<https://sarahmaker.com/how-to-make-a-no-sew-face-mask-with-at-home-materials/>

To commence this challenge, you may like to follow the design steps below;

1. Research effective designs, materials and production methods. You may like to draw on information gathered in previous challenges or your own research
2. Design your face mask, using diagrams, labels and technical drawings
3. Prototype your product to test out your design
4. Make any necessary adjustments to your overall design based on what you have learnt from the prototyping stage, and produce your final face mask.

Share images of your completed face masks, accompanied by a design statement that outlines the materials and processes used to create your mask, with UOW Makerspace using the hashtags #UOWMakerspace #UOWmakerspacechallenges and via email to makerspace@uow.edu.au.

The winning teams/schools will have their design shared on UOW Makerspace social media platforms and attend a UOW Makerspace excursion (virtual or face-to-face).

All entrants will also receive a certificate of participation for their work on this community-based challenge

Links and Outcomes – Primary

Challenge 3: Reusable masks from household materials						
<u>Outcomes</u>	Stage 2 – Years 3 and 4					
	<p>ACTDEK013 – Investigate the suitability of materials, systems, components, tools and equipment for a range of purposes</p> <p>ACSSU074 – Natural and processed materials have a range of physical properties that can influence their use</p> <p>ACTDEP016 – Select and use materials, components, tools, equipment and techniques and use safe work practices to make designed solutions</p>					
<u>Cross Curriculum Priorities</u>	Stage 3 – Years 5 and 6					
	<p>ASSU095 – Changes to materials can be reversible or irreversible</p> <p>ACTDEK023 – Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use</p> <p>ACTDEP026 – Select appropriate materials, components, tools, equipment and techniques and apply safe procedures to make designed solutions</p>					
<u>Cross Curriculum Priorities</u>	<p>OI.6 The sustainability of ecological, social and economic systems is achieved through informed individual and community action that values local and global equity and fairness across generations into the future.</p>					
<u>G e n e r a l C a p a b i l i t i e s</u>	Critical and Creative Thinking > Generating ideas, possibilities and actions					
	<i>Consider alternatives</i>					
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Explore situations using creative thinking strategies to propose a range of alternatives</td> <td style="width: 50%; padding: 5px;">Identify situations where current approaches do not work, challenge existing ideas and generate alternative solutions</td> </tr> <tr> <td colspan="2" style="text-align: center; padding: 5px;"><i>Seek solutions and put ideas into action</i></td> </tr> <tr> <td style="padding: 5px;">Experiment with a range of options when seeking solutions and putting ideas into action</td> <td style="padding: 5px;">Assess and test options to identify the most effective solution and to put ideas into action</td> </tr> </table>	Explore situations using creative thinking strategies to propose a range of alternatives	Identify situations where current approaches do not work, challenge existing ideas and generate alternative solutions	<i>Seek solutions and put ideas into action</i>		Experiment with a range of options when seeking solutions and putting ideas into action
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<i>Seek solutions and put ideas into action</i>						
Experiment with a range of options when seeking solutions and putting ideas into action	Assess and test options to identify the most effective solution and to put ideas into action					

Links and Outcomes – Secondary

Challenge 3: Reusable masks from household materials					
<u>Outcomes</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Stage 4 – Years 7 and 8</th> <th style="width: 50%; text-align: center;">Stage 5 – Years 9 and 10</th> </tr> </thead> <tbody> <tr> <td> <p>AC SIS065 – With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate materials and equipment</p> <p>AC SSU074 – Natural and processed materials have a range of physical properties that can influence their use</p> <p>AC TDEP035 – Critique needs or opportunities for designing and investigate, analyze and select from a range of materials, components, tools, equipment and processes to develop design ideas</p> <p>AC TDEP037 – Select and justify choices of materials, components, tools, equipment and techniques to effectively and safely make designed solutions</p> </td> <td> <p>AS SU095 – Changes to materials can be reversible or irreversible</p> <p>AC SIS103 – Identify, plan and apply the elements of scientific investigations to answer questions and solve problems using equipment and materials safely and identifying potential risk</p> <p>AC TDEK046 – Investigate and make judgements on how the characteristics and properties of materials, systems, components, tools and equipment can be combined to create designed solutions</p> <p>AC TDEP049 – Develop, modify and communicate design ideas by applying design thinking, creativity innovation and enterprise skills of increasing sophistication</p> </td> </tr> </tbody> </table>	Stage 4 – Years 7 and 8	Stage 5 – Years 9 and 10	<p>AC SIS065 – With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate materials and equipment</p> <p>AC SSU074 – Natural and processed materials have a range of physical properties that can influence their use</p> <p>AC TDEP035 – Critique needs or opportunities for designing and investigate, analyze and select from a range of materials, components, tools, equipment and processes to develop design ideas</p> <p>AC TDEP037 – Select and justify choices of materials, components, tools, equipment and techniques to effectively and safely make designed solutions</p>	<p>AS SU095 – Changes to materials can be reversible or irreversible</p> <p>AC SIS103 – Identify, plan and apply the elements of scientific investigations to answer questions and solve problems using equipment and materials safely and identifying potential risk</p> <p>AC TDEK046 – Investigate and make judgements on how the characteristics and properties of materials, systems, components, tools and equipment can be combined to create designed solutions</p> <p>AC TDEP049 – Develop, modify and communicate design ideas by applying design thinking, creativity innovation and enterprise skills of increasing sophistication</p>
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<u>Cross Curriculum Priorities</u>	<p>OI.6 The sustainability of ecological, social and economic systems is achieved through informed individual and community action that values local and global equity and fairness across generations into the future.</p>				
G e n e r a l C r e a t i v e T h i n k i n g	<i>Consider alternatives</i>				
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<i>Seek solutions and put ideas into action</i>					
Critical and Creative Thinking > Generating ideas, possibilities and actions	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 50%;"> <p>Predict possibilities, and identify and test consequences when seeking solutions and putting ideas into action</p> </td> <td style="width: 50%;"> <p>Assess risks and explain contingencies, taking account of a range of perspectives when seeking solutions and putting complex ideas into action</p> </td> </tr> </tbody> </table>	<p>Predict possibilities, and identify and test consequences when seeking solutions and putting ideas into action</p>	<p>Assess risks and explain contingencies, taking account of a range of perspectives when seeking solutions and putting complex ideas into action</p>		
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Challenge 4: Digital Awareness Campaign

Many people may not be aware of how much waste is created from disposable masks as a result of the COVID-19 pandemic. This creates a need to spread awareness about more sustainable options for reusable masks and how people could create one themselves.

What issues surround the use and recycling of disposable masks? Why is there a need for reusable masks? How can people make their own masks, and make a difference themselves?

This challenge requires you to develop a series of messages that could be used as a digital campaign to spread awareness about single-use masks and waste. You should include information about the issues surrounding disposable masks, alternate sustainable options and ways people can make their own reusable mask.

You might like to start your research with some of the following links.

- **The Conversation: Coronavirus face masks – an environmental disaster that might last generations (August, 2020)**
An article that explores various issues associated with disposable face masks
<https://theconversation.com/coronavirus-face-masks-an-environmental-disaster-that-might-last-generations-144328>
- **National Geographic: How to stop discarded face masks from polluting the planet (April, 2021)**
Different perspectives on the pollution from disposable masks and solutions associated
<https://www.nationalgeographic.com/environment/article/how-to-stop-discarded-face-masks-from-polluting-the-planet>

To complete this challenge, you will need to develop a series of posts or messages that could be shared on social media as part of an awareness campaign related to disposable mask waste. These messages could take the form of videos, animations, photos and/or illustrations that explore these ideas for people your age.

Share your awareness messages with UOW Makerspace using the hashtags #UOWMakerspace #UOWmakerspacechallenges and via email to makerspace@uow.edu.au.

The winning teams/schools will have their full campaign shared on UOW Makerspace social media platforms and attend a UOW Makerspace excursion (virtual or face-to-face).

All entrants will also receive a certificate of participation for their work on this community-based challenge

Links and Outcomes - Primary

Challenge 4: Digital Awareness Campaign			
		Stage 2 – Years 3 and 4	Stage 3 – Years 5 and 6
<u>Outcomes</u>		<p>ACTDIP013 – Plan, create and communicate ideas and information independently with others, applying agreed ethical and social protocols</p> <p>ACELA1793 – Identify features of online texts that enhance readability including text navigation, links, graphics and layout</p> <p>AC SIS068 – Use a range of methods including tables and simple column graphs to represent data to identify patterns and trends</p> <p>AC SIS071 – Represent and communicate observations, ideas and findings using formal and informal representations</p>	<p>ACELY1714 – Plan, draft and publish imaginative, informative and persuasive texts, choosing and experimenting with text structures, language features, images and digital resources appropriate to purpose and audience</p> <p>ACTDIP022 – Plan, create and communicate ideas and information, including collaboratively online, applying agreed ethical, social and technical protocols</p> <p>AC SIS107 – Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate</p> <p>AC SIS110 – Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts</p>
<u>Cross Curriculum Priorities</u>		OI.7 Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.	
G e n e r a l C a p a b i l i t y	Critical and Creative Thinking > Identifying, exploring and organizing information and ideas	<i>Organise and process information</i>	
		Collect, compare and categorise facts and opinions found in a widening range of sources	Analyse, condense and combine relevant information from multiple sources
	-----	<i>Draw conclusions and design a course of action</i>	
	> Analysing, synthesizing and evaluating reasoning and procedures	Draw on prior knowledge and use evidence when choosing a course of action or drawing a conclusion	Scrutinise ideas or concepts, test conclusions and modify actions when designing a course of action
	Information and Communication Technologies > <i>Creating with ICT</i>	<i>Generate solutions to challenges and learning area tasks</i>	
		Create and modify simple digital solutions, creative outputs or data representation/transformation for particularly purposes	Independently or collaboratively create and modify digital solutions, creative outputs or data representation/transformation for particular audiences and purposes
	-----	<i>Compose spoken, written, visual and multimodal learning area texts</i>	
	Literacy > Composing texts through speaking, writing and creating	Compose and edit a range of learning area texts	Compose and edit learning area texts

Links and Outcomes - Secondary

Challenge 4: Digital Awareness Campaign			
		Stage 4 – Years 7 and 8	Stage 5 – Years 9 and 10
<u>Outcomes</u>		<p>ACTDIP032 – Plan and manage projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account</p> <p>ACELY1808 – Use interaction skills for identified purposes, including voice and language conventions to suit different situations, selecting vocabulary, modulating voice and using elements such as music, images and sound for special effects</p> <p>ACSIS145 – Summarise data from students own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions based on evidence</p> <p>ACSIS148 – Communicate ideas, findings and evidence-based solutions to problems using scientific language, and representations, using digital technologies as appropriate</p>	<p>ACELY1756 – Create sustained texts, including texts that combine specific digital or media content, for imaginative, informative or persuasive purposes that reflect upon challenging and complex issues</p> <p>ACELY1776 – Use a range of software, including word processing programs confidently, flexibly and imaginative to create, edit and publish texts, considering the identified purpose and the characteristics of the user</p> <p>ACSIS208 – Communicate scientific ideas and information for a specific purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations</p>
<u>Cross Curriculum Priorities</u>		OI.7 Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.	
G e n e r a l C a p a b i l i t y	Critical and Creative Thinking > Identifying, exploring and organizing information and ideas	<i>Organise and process information</i>	
		Critically analyse information and evidence according to criteria such as validity and relevance	Critically analyse independently sourced information to determine bias and reliability
	-----	<i>Draw conclusions and design a course of action</i>	
	> Analysing, synthesizing and evaluating reasoning and procedures	Differentiate the components of a designed course of action and tolerate ambiguities when drawing conclusions	Use logical and abstract thinking to analyse and synthesise complex information to inform a course of action
	Information and Communication Technologies > <i>Creating with ICT</i>	<i>Generate solutions to challenges and learning area tasks</i>	
		Design and modify simple digital solutions, or multimodal creative outputs or data transformations for particularly audiences and purposes following recognised conventions	Design, modify and manage complex digital solutions or multimodal creative outputs or data transformations for a range of audiences and purposes
-----	<i>Compose spoken, written, visual and multimodal learning area texts</i>		
Literacy > Composing texts through speaking, writing and creating	Compose and edit longer sustained learning area texts	Compose and edit longer and more complex learning area texts	