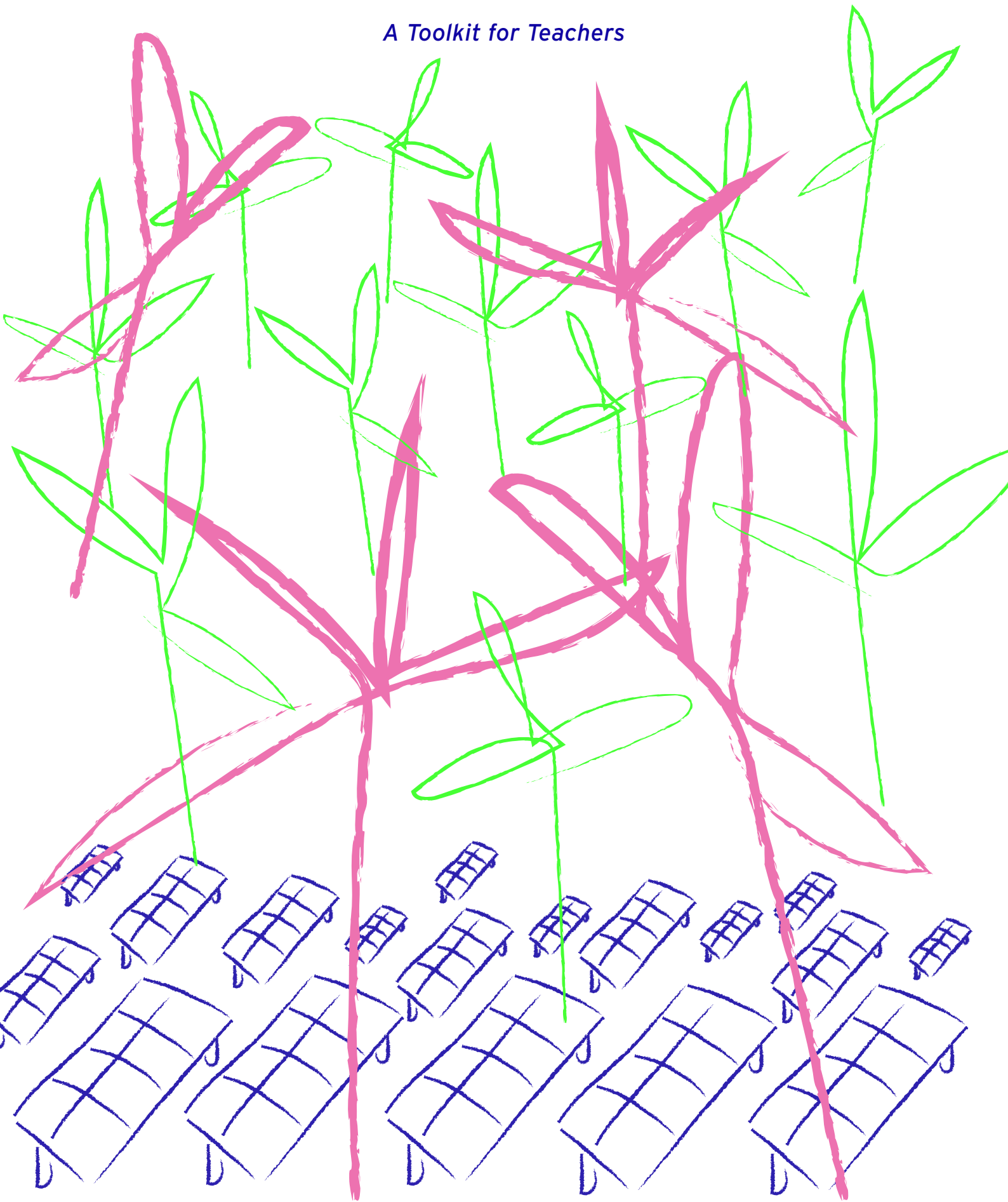


Green Skills for a Low Carbon Future

A Toolkit for Teachers



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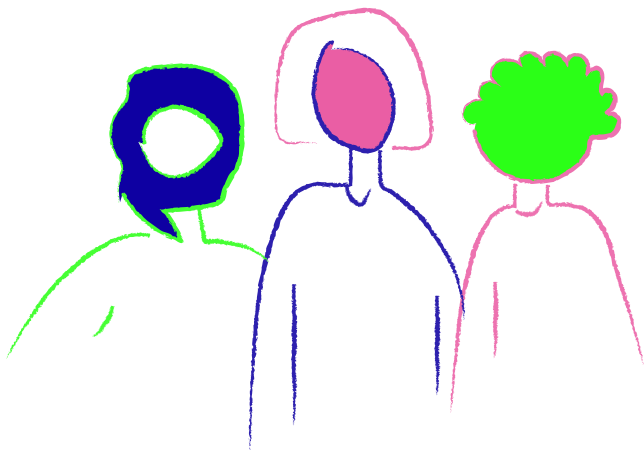
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Contents page

Welcome to the Toolkit p4

Why Green Skills Are Important p6

What Are Green Skills? p9

Engineering and Technical Skills p12

The Power of Scientific Skills p22

Operation Management Skills p28

Leading Accountability with Monitoring Skills p36

Insights from the Field p42

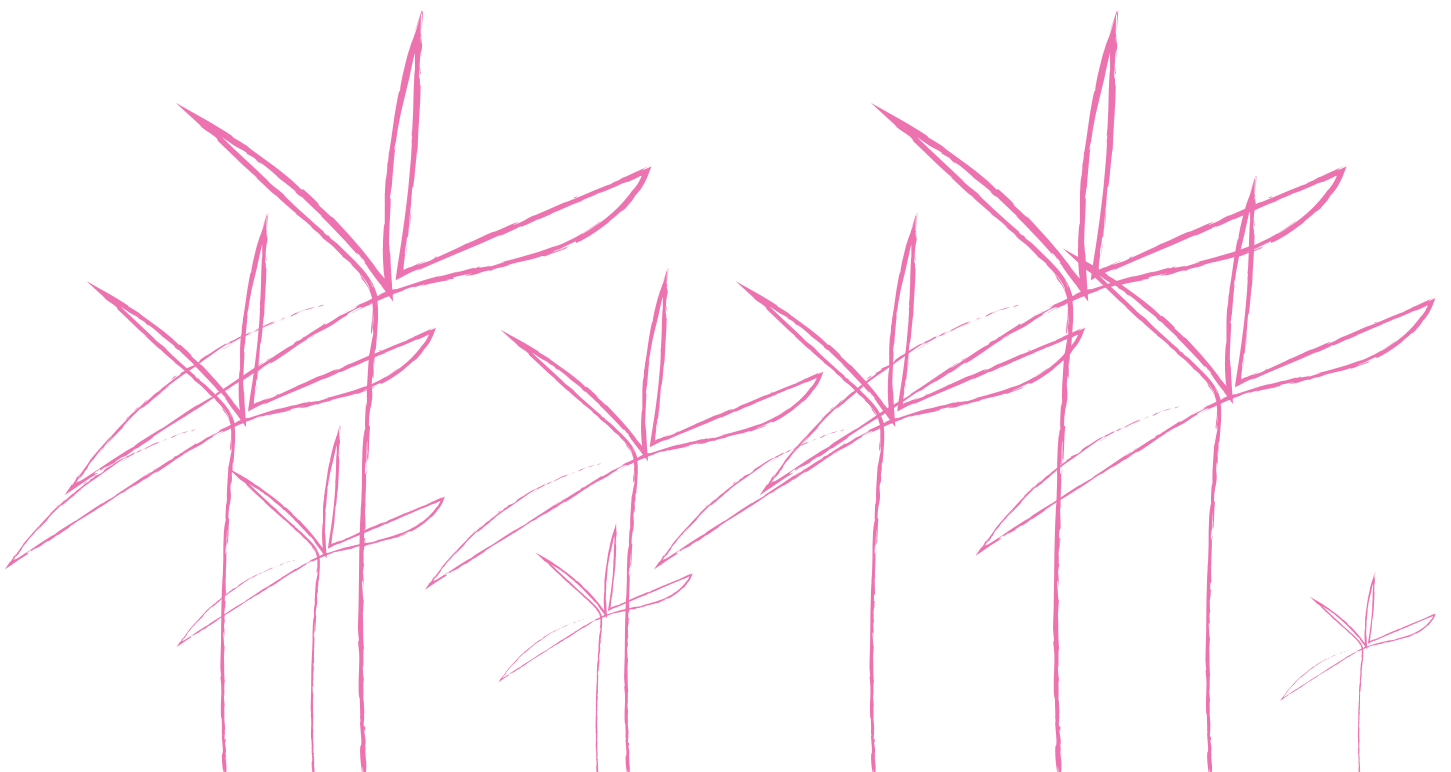
Welcome to the Toolkit

Welcome to Kingston University's Green Skills toolkit for change makers!

As we navigate the challenges of poverty, injustice, climate change, and biodiversity loss, we believe in empowering students, staff, and our wider community.

Our mission? To equip students with green skills - the kind that can build a low-carbon industry, economy, and society.

This toolkit isn't just a manual; it's a future-focused vision. Developed by Kingston University students, it's all about understanding and addressing the complex environmental impacts of our time.



How to Use the Toolkit

So, how can you use this toolkit?

Dive into each section! You'll find inspiring examples of green skills and jobs, along with activities you can adapt and implement. And yes, those videos? They're perfect for sparking your students' interest in all things green.

Let's make sustainability contagious!



Why Green Skills Are Important



youtu.be/OFxfoUh0nEQ?si=gQirw7yAJjsP0l8G

Embracing a Greener Tomorrow

The call for a greener economy reverberates across the globe. Our planet faces formidable challenges—climate change, resource depletion, pollution, and the biodiversity crisis. To forge a sustainable future, we must act.

Imagine a world with low-carbon emissions. They're our tools against these pressing issues.

But How Do We Make This Transition?

- * **Governance and Policy:** We need smart rules and regulations. Policies that nudge us toward sustainability.
- * **Business Transformation:** Companies must evolve. New processes, fresh business models—they're the keys to change.
- * **Individual Impact:** It starts with you. Understand, care, and act. Your choices matter.
- * **Skills for the Green Economy:** As we shift, new jobs emerge. Skills like renewable energy expertise, circular design, and eco-marketing become gold.



The Skills Needed in a Green Economy Will Change in 3 Ways:

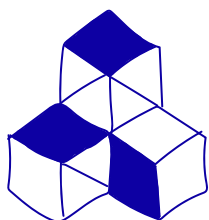
1. New economic activities will create new jobs needing new skills and qualifications
2. Within existing jobs, there will be increased demand for certain tasks and less demand for other tasks.
3. Existing jobs and industries will become greener, which will require adjustments to current training frameworks

(www.unido.org/stories/what-are-green-skills
and
carbonliteracy.com/green-skills-for-green-jobs/).

UN Sustainable Development Goals

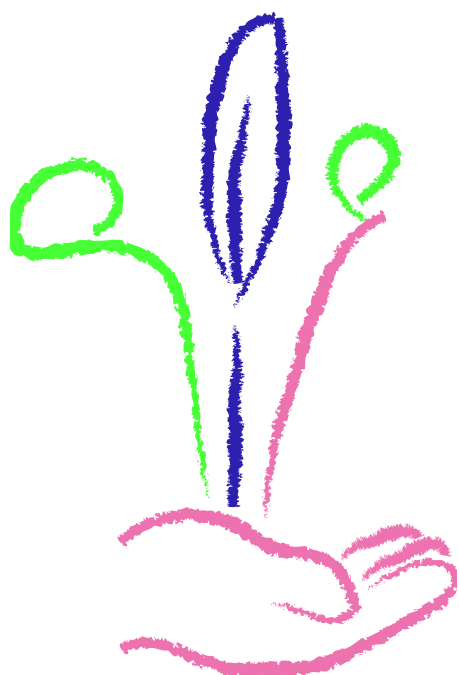
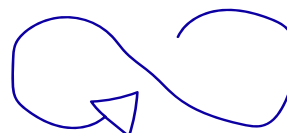
9. Industry, Innovation and Infrastructure

Includes upgrading infrastructure and retrofitting industries to make them sustainable, with increased resource use efficiency.



12. Responsible Consumption and Production

Includes the target of achieving the sustainable management and efficient use of natural resources by 2030 (UNIDO)



Increasing the green skills of the workforce sits directly under the UN Sustainable Development Goals (SDG) 9 and 12 and will contribute to many other SDGs, directly and indirectly.

Adapted from
www.unido.org/stories/what-are-green-skills
and
carbonliteracy.com/green-skills-for-green-jobs/

What Are Green Skills?

Green skills are the knowledge, abilities, values and attitudes needed to live in, develop and support a sustainable and resource-efficient society which reduces the impact of human activity on the environment.

Green skills are the skills that citizens will need in the green economy. Green skills are the knowledge, behaviours, capabilities and technical skills used for economic activities that unlock opportunities and solve environmental problems. This term is often used to describe the technical knowledge and abilities needed to operate and develop new green technology for a low-emissions economy.

Increasingly comprehensive environmental regulations require organisations to change, creating demand for employment with green skills. As green technologies are skills based, it is expected that the demand for high-skilled workers will increase.

(<https://post.parliament.uk/research-briefings/post-pn-0711/>
and
www.unido.org/stories/what-are-green-skills)



www.youtube.com/watch?v=bCB7rimjwf4

The concept of green skills is a broad one. It can include many hard and soft skills used in professional settings. Green skills can be any skill used within both 'green jobs,' or any occupation with aspects related to sustainability and efficient working or tackles any aspect of climate change. All industries and sectors are making the green transition, but industries that particularly value green skills include energy production, transportation and finance.

Green industries, and societies, require employees with green skills. It is important to embed these green skills in all levels of education.

Green jobs can either produce goods or services that benefit the environment or conserve natural resources. Green jobs involve making production processes more environmentally friendly. A single job may involve both green and non-green tasks.

Green Economy

An economy that operates safely within planetary environmental boundaries, notably with regard to a stable climate and healthy biodiversity ecosystems.

Green Jobs

Occupations that cannot be performed without knowledge or green skills. If green skills are central to the job, then the greening of the economy is its primary focus.

Green Transition

The process of evolution towards a green economy. This notably includes delivering on the goal of the Paris Agreement of net-zero emissions to limit global temperature increase to as close to 1.5 degrees as possible.



Categories of Green Skills

Skills generally required for jobs can be divided into hard skills and soft skills (also known as technical and transversal). Green skills can be both.

Soft skills transcend disciplinary boundaries, making them invaluable in an ever-evolving economy. As our world becomes more specialised and tech-driven, these human-centric and creative abilities take centre stage.

Soft skills:

When it comes to the green economy, consider these soft and transferable gems:

- * **Design Thinking:** Craft innovative solutions with empathy and user-centric approaches.
- * **Adaptability:** Flexibility in the face of change—essential for navigating sustainability challenges.
- * **Resilience:** Bounce back, learn, and thrive even amidst environmental shifts.
- * **Empathy:** Understand diverse perspectives and collaborate effectively.

Green skills:

Adding to the soft skills that are needed a set of important skills are as follows:

- * **Engineering and Technical Skills**
- * **Science Skills**
- * **Operation Management Skills**
- * **Monitoring Skills**

They're the secret sauce for a brighter, greener future.

Adapted from
www.unido.org/stories/what-are-green-skills,
and
www.nber.org/papers/w21116,
and
, www.greencareershubs.com/green-future/green-skills/
and
<https://economicgraph.linkedin.com/research/global-green-skills-report>.

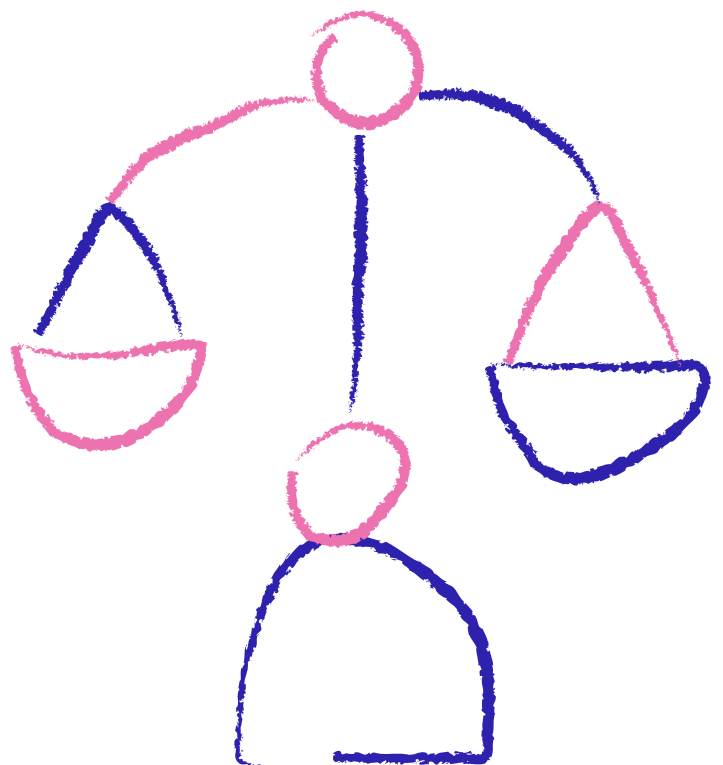
Unlocking a Low-Carbon Future: Engineering and Technical Skills

Picture this: a world where technology hums in harmony with the environment. That's our goal. And these skills? They're the abilities that we use to plan and realize that vision.

1. Design and Construction: Blueprint to reality. Build structures that breathe sustainability.
2. Maintenance and Assessment: Keep the gears turning. Evaluate impact, tweak, optimize.
3. Environmentally Oriented Building: Think green roofs, energy-efficient HVAC, and eco-friendly materials.
4. Renewable Energy: Solar panels, wind turbines—the future is powered by nature.
5. Industry Efficiencies: Trim waste, save resources. Efficiency is our compass.

Who wields these skills? Engineers, technicians, and the curious minds behind R&D projects. Together, we'll build a cleaner, brighter tomorrow!

www.nber.org/papers/w21116.



Skills that fit within this category:

- * Design
- * Creativity
- * Ingenuity
- * Listening
- * Electrical engineering
- * Process thinking
- * Problem solving
- * Teamwork
- * Analysing data
- * Working under pressure
- * Inquisitiveness
- * Confidence to challenge the norm
- * Renewable energy knowledge

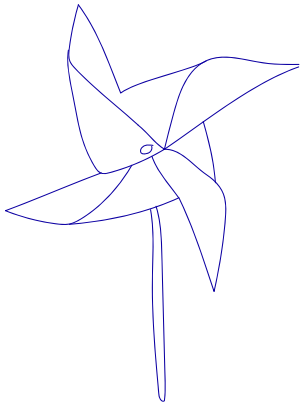
Jobs that fit within this category:

- * Solar Panel Technician
- * Architect
- * Environmental Engineer
- * Town Planner
- * Wind Turbine Technician
- * Electric Vehicle Expert
- * Product Designer
- * Electric and Heating Installer
- * Retrofitting Coordinator
- * Quantity Surveyor
- * Building Surveyor
- * Building Environment Engineer
- * Plumber
- * Construction Worker
- * Mechanic
- * Air conditioning Technician
- * Horticulturist
- * Ecologist
- * Materials Scientist



Activity 1: Create a Paper Wind Turbine

In this activity, students create a paper pinwheel. The pinwheel will turn when blown on and demonstrates the essential components of energy transfer to make the pinwheel move. A lot of electricity is produced by turning a turbine. This is either powered by rising steam from the heat of nuclear reactions, burning fossil fuels or directly propelled by wind. The blades spin around a rotor (in this case, the pin), which is connected to a generator, creating electricity.

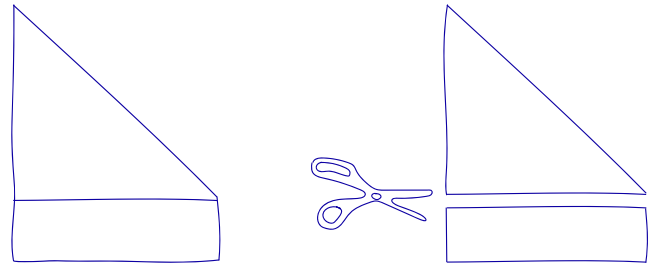


Time: 30 minutes.

Age range: Primary School children (aged above 6).

Materials needed per pinwheel:

- * A pin
- * A square piece of paper (this can be cut from A4)
- * A paper straw / A pencil with a rubber
- * Scissors
- * Colouring pencils, pens, markers, and crayons (optional)
- * A collage of a paper triangles and a pair of scissors

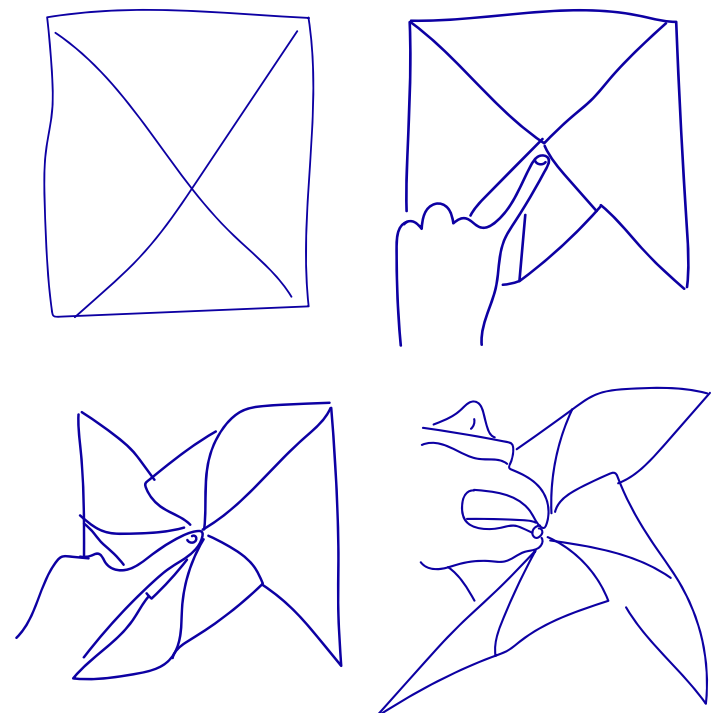


Step 1: Make the Paper Square

If you have a square piece of paper, you can begin decorating it! If not, fold a top corner to meet another edge, forming a triangle, and cut off the extra paper. Colour in both sides of the paper.

Step 2: Make the Wheel

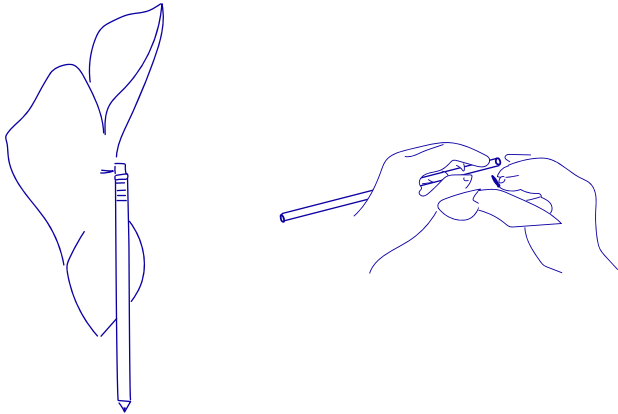
Fold the corners of the paper the other way, so there is an 'X' of folds across the paper. Then, cut halfway along the length of these folds. Hold each corner to the middle of the paper, but do not fold it.



Step 3: Put the pin in

With adult supervision, put the pin through the front of the pinwheel, so that it holds all of the corners together.

Step 4: Attach the Handle



Stick the pin through the paper straw to attach the handle. Ideally, the pin would be short enough to not stick out the other side. Alternatively, it can be pushed into the rubber on the end of a pencil, or you could even put an old earring at the pointy end of the pin. Now enjoy your pinwheel!

Step 5: Reflect

Think of any windmills or wind turbines in your area. Are they still used? What are they used for? If there are none, why do you think this is?

Who works in renewable energy and wind turbines?

Discuss whether there could be wind turbines in your area.



Adapt

>1

- * For slightly older students, you can make a paper windmill using origami – no scissors needed!

Activity adapted from following resources:

<https://thinkplaycreate.org/blog/diy-wind-powered-pinwheel/>

<https://www.youtube.com/watch?v=4N0dX5EKWz8>

<https://kcparent.com/summer/diy-paper-pinwheels/>



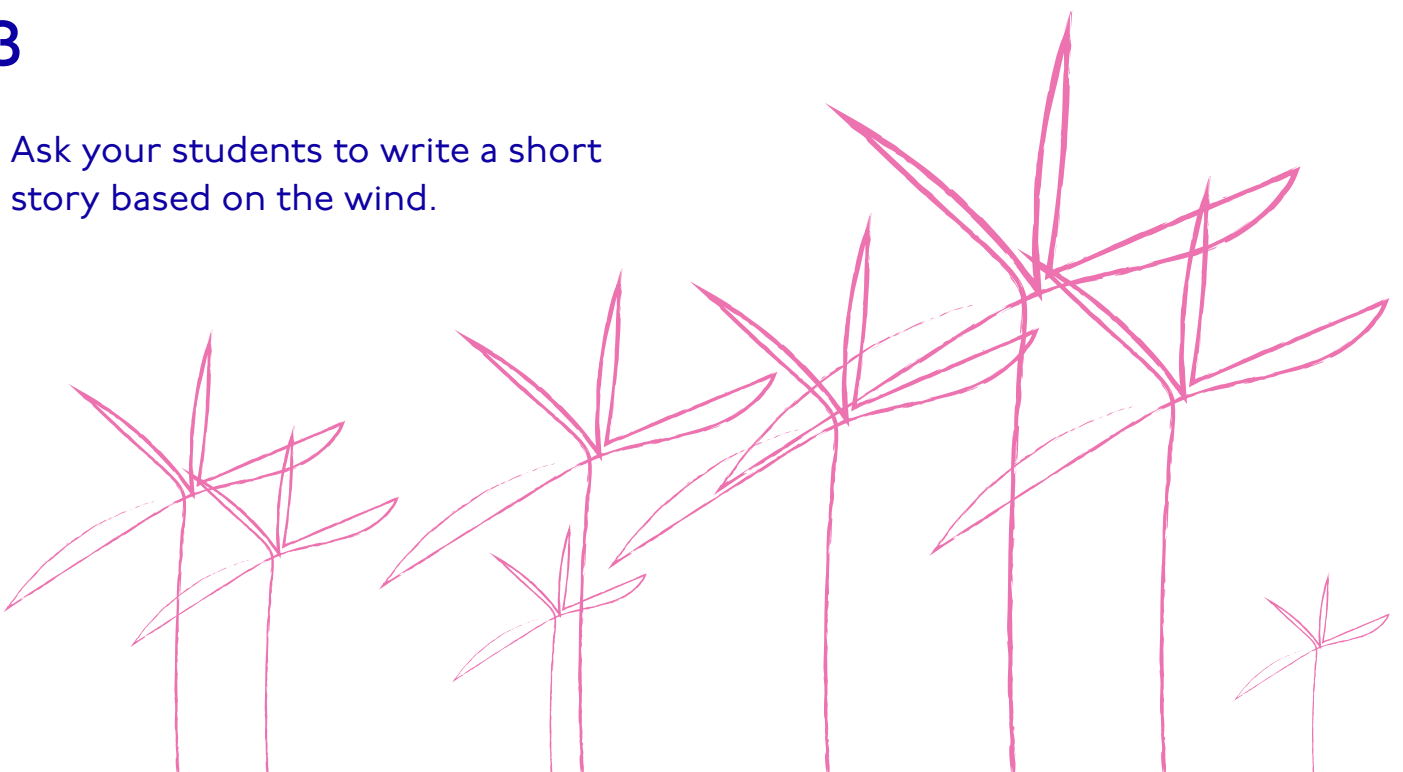
www.youtube.com/watch?v=5AK3fKEafCg

>2

- * Organise a field trip to an operational wind farm, a historic windmill, or any renewable production centre. Maps of sites with renewable energy production can be found at www.mygridgb.co.uk/map/ and renewables-map.robinhawkes.com.

>3

- * Ask your students to write a short story based on the wind.



Activity 2: Exploring Solar Energy and Photovoltaic (PV) Cells

This activity involves using PV cells to power circuits so students can become familiar with implementing renewable energy. Photovoltaic (PV) cells directly convert sunlight into electricity. They are made of semiconductors, often silicon, which absorb a photon with enough energy and release an electron, allowing electricity to flow. A PV Cell must also have at least one electric field, which creates a voltage. Solar cells only absorb around 15% of sunlight energy as the material will only release electrons with specific wavelengths, but sunlight has many different electromagnetic wavelengths.

Time: 30 minutes

Age range: upper primary school and secondary school

Materials Needed:

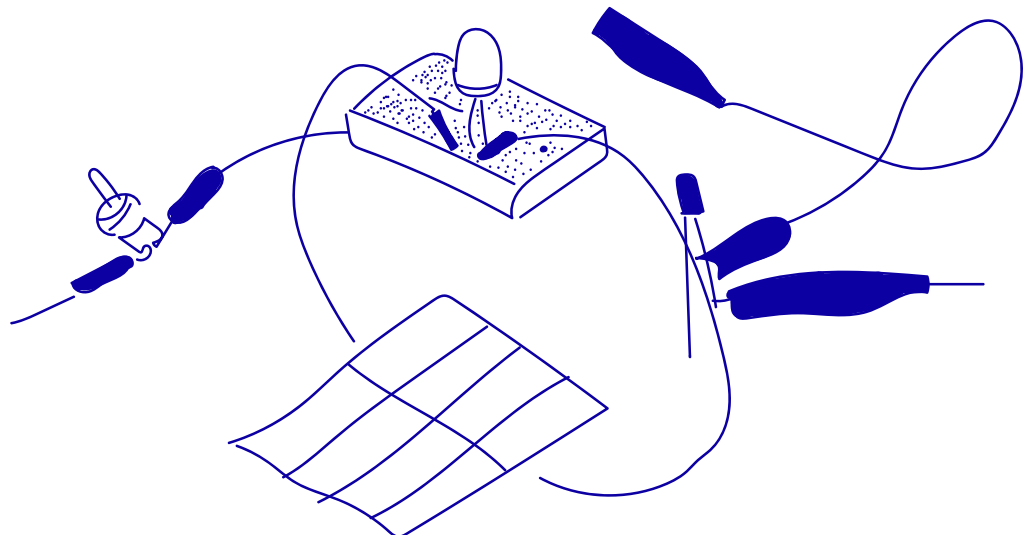
- * Solar cells
- * A multimeter
- * A small light bulb
- * Connecting wires
- * Crocodile clips

Step 1:

Start thinking about photovoltaics. Where have you seen solar panels? Are you carrying one with you right now? (For example, watches, calculators, and lights). Does your school have solar panels? Why do you think they are used where they are or not used in other situations?

Step 2:

Now, let's get hands-on. Connect a solar cell to a lightbulb, forming a circuit, and position the solar cell towards the sun's rays. Does the lightbulb illuminate? Measure the voltage and current. You've got this!

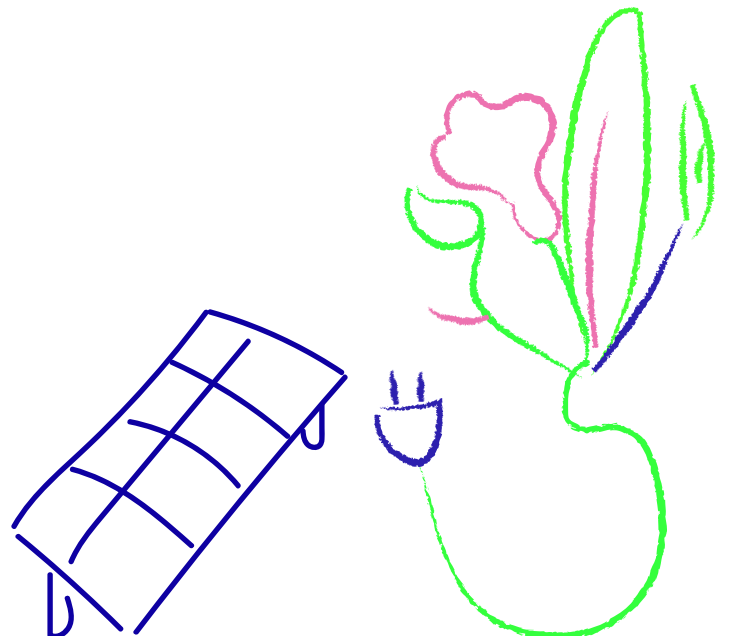


Step 3:

Continue attaching solar cells in series.
Measure the voltage and current as
each one is attached.

Solar cells connected in a series	Current (A)	Voltage (V)	Power (W)	Did light bulb light up?
1.				
2.				
3.				
4.				
5.				
6.				
7.				

How many solar cells does it take for
the light bulb to light up?

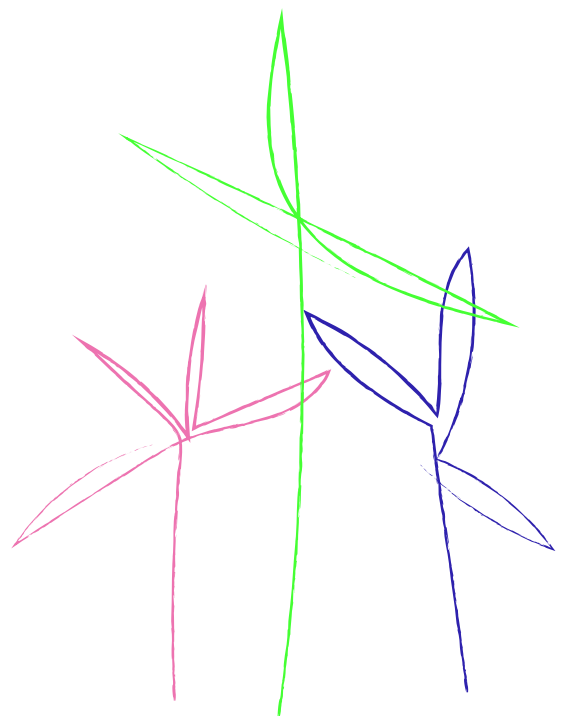


Step 4:

Disconnect the solar cells and make a circuit of two solar cells in parallel.

Continue adding solar cells one at a time in parallel and measure the current and voltage each time. How many are needed to make the light bulb light up?

Solar cells connected in a parallel	Current (A)	Voltage (V)	Power (W)	Did light bulb light up?
1.				
2.				
3.				
4.				
5.				
6.				
7.				



Step 5:

Calculate the power produced by your solar cells. Is this similar to the power rating of the lightbulb?

What was the maximum power produced by your solar cells? What is the advantage of the parallel circuits, and what is the advantage of the circuits in series? In what situations would you use each?

Step 6 (Older students only):

Plot current against voltage for each set-up. Then, repeat the measurements using batteries instead of solar cells. How do the solar cells compare to the batteries? Discuss whether you would use batteries or solar cells. What are the advantages and disadvantages of solar power?

Step 7 (optional):

Measure the differences that shading, angle, distance from the light source, and heat have on the output of the solar cells.

Adapt:

>For younger students

Have each student design a house from cardboard, foam, or other arts and crafts materials. Colour in and assemble the house. Stick a solar cell on each house and attach it to a lightbulb. Put all the houses together to create a solar-powered model metropolis!

Activity adapted from

www.ccmr.cornell.edu/wp-content/uploads/sites/2/2015/11/PhotovoltaicCells.pdf

and

<https://www.dorsetcommunityenergy.org.uk/wp-content/uploads/2017/05/Teachers-solar-energy-pack.pdf>

and

www.solar4rschools.org/sites/all/files/Activity%207%20-%20Photovoltaic%20Experiments_0.pdf

and

https://www.teachengineering.org/activities/view/cub_pveff_lesson03_activity1

Further Resources:

Green Skills Resource:

<https://www.greenskillsresources.com/>

STEM Resource Library:

<https://www.stem.org.uk/resources/elibrary/resource>

<https://phet.colorado.edu/en/simulations/browse>

Create a solar cell in a school laboratory:

<https://www.stem.org.uk/resources/elibrary/resource/28155/make-graetzel-solar-cell>

(Secondary-school level)

Example of an Eco School:

<https://tv.theiet.org/?videoid=6592>

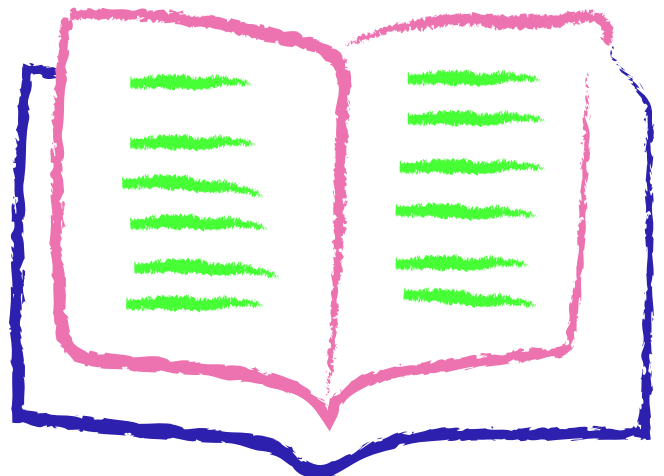
Discuss how your school can become more environmentally friendly:

<https://education.theiet.org/secondary/teaching-resources/make-a-night-light-circuit>

Create a jitterbug using solar cells:

https://www.teachengineering.org/activities/view/cub_envir_lesson09_activity1

https://solardata.uoregon.edu/download/Lessons/Experiments_with_PV_Cells.pdf



The Power of Scientific Skills

These skills trace their roots to the traditional sciences—physics, chemistry, and biology. Their impact, however, extends far beyond the lab.

Here's why they matter:

1. Innovation Fuel:

Scientific knowledge drives innovation. It's the spark behind breakthroughs in various fields.

2. Versatility:

These skills can be applied across multiple domains. Think modelling, process development, and utility sectors.

3. Practical Applications:

- * Agriculture: Boost crop yields and sustainable farming practices.
- * Water Management: Ensure clean water provision and effective treatment.
- * Electricity and Health: Power grids, medical advancements — the possibilities are electrifying!

www.nber.org/papers/w21116.

Skills that fit within this category:

Data analysis

- * Learn to collect data and analyse data from chemical experiments, such as air and water quality tests

Experimental design

- * Defining the hypothesis
- * Literature review
- * Identifying variables
- * Designing and planning the experiment
- * Choosing the materials and equipment
- * Safety considerations
- * Data collection
- * Risk assessment
- * Drawing conclusions
- * Communicating results

Chemical identification

- * Identifying the common chemicals and pollutants in the environment and understanding their effects

Environmental monitoring

- * Setting up and maintaining monitoring stations for tracking environmental quality over time

Sustainable chemistry

- * Applying the principles of green chemistry and how to minimise the environmental impact of chemical processes

Energy assessment

- * Assessing different energy sources and their environmental impacts, including calculating the efficiency of renewable energy systems

Model building

- * Using physics instruments such as thermometers to measure environmental conditions

Climate data interpretation

- * Interpreting climate data and understand the physics behind climate change patterns and trends

Understanding ecosystems and renewable energy

Laboratory techniques



Jobs that fit within this category:

Environmental Scientist

- * Conduct research to identify and eliminate sources of pollution and hazards that affect public health, wildlife, and the environment

Renewable Energy Technician

- * Install, maintain, and repair renewable energy systems like solar panels and wind turbines

Conservation Biologist

- * Study the ecosystem and wildlife to develop conservation plans and protect biodiversity

Environmental Engineer

- * Design systems and solutions to environmental problems, such as water supply, air pollution control, and waste management

Sustainability Consultant

- * Oversee and implement sustainability initiatives within organisations to reduce environmental impact

Climate Change Analyst

- * Analyse data to understand the impacts of climate change and develop strategies for mitigation and adaptation

Environmental Data Analyst

- * Use statistical and computational methods to analyse environmental data and inform policy and management decisions

Ecotoxicologist

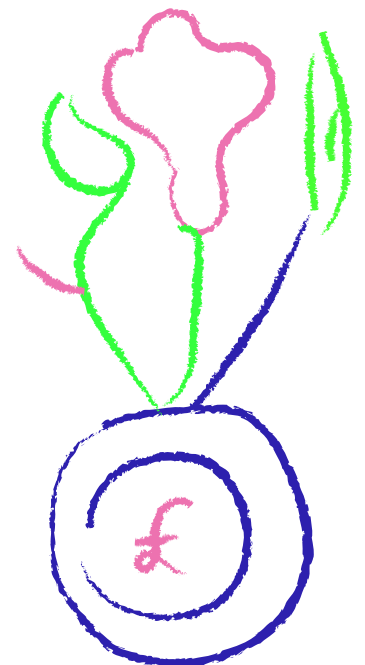
- * Investigate the effects of toxic substances on ecosystems and wildlife

Environmental Microbiologist

- * Study the role of microorganisms in environmental processes and their impact on health and pollution

Geoscientist

- * Investigate the physical aspects of the Earth, including the atmosphere, hydrosphere, and lithosphere, to understand natural resources and environmental issues



Activity: Scientific Skills

One of the consequences of having more CO_2 in the atmosphere is greater absorption of this gas by the oceans. When ocean water (H_2O) and carbon dioxide (CO_2) mix, carbonic acid (H_2CO_3) is formed and dissociates to form carbonate ions (CO_3^{2-}) and bicarbonate (HCO_3^-), by hydrogen release (H^+).

Acidity is due to the presence of hydrogen ions in a solution – in this case, seawater. The more ions in solution, the more acidic the water (the lower its pH). Acidity [or whatever the substantial thing you want to put here] negatively affects the formation of the external skeleton of many marine organisms, such as bivalves, gastropods, and corals, which depends on the availability of the carbonate ion (CO_3^{2-}).

Time: 30 minutes

Age range: Secondary School

Materials needed:

- * 500 ml of hydrochloric acid
- * 5 mollusc shells (mussel, limpet or whelk), with similar dimensions, but of a single kind, well dried and clean
- * 5 250-mL glasses or glass containers, individually labelled (1 to 5)
- * Scale
- * Tongs
- * Adequate safety equipment
- * Stopwatch or clock
- * Laboratory notebook

Step 1:

On the day before, leave the shells in a container with water to hydrate them.

Step 2:

Drain the shells, placing them on absorbent paper until the excess water disappears. Weigh the shells individually and note the values in the table.

Step 3:

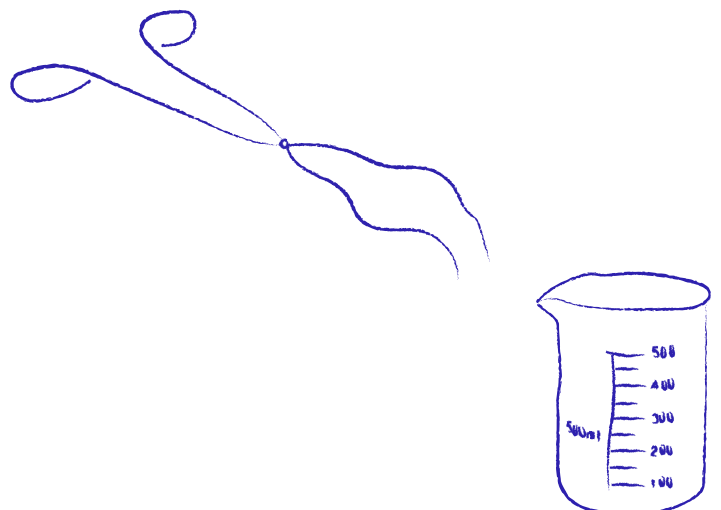
Pour 100 ml of acid into each of the containers. Add one shell to each container and label the containers.

Step 4:

After 2 minutes, remove the shell from container 1 using tongs. Drain well to remove the excess liquid, weigh, and record the value obtained in the table.

Step 5:

Repeat the same procedure for each shell every 2 minutes.



Step 6:

Draw a graph that illustrates the evolution of the variation in weight over time.

Time (min)	Initial mass (mg) m_i	Final mass (mg) m_f	Mass difference (mg) $\Delta m = m_f - m_i$
0			
2			
4			
6			
8			
10			

Step 7:

Discuss in your group:

- * Are the results we obtained as we expected?
- * What happened to the shell when it was dipped in acid?
- * What happened to the weight of the shell over the course of the experiment?

The equation that translates the chemical reaction of dissociation by the effect of an acid on the shell is:



- * What gas will be produced when the shell dissolves?
- * What does the evolution of the variation in weight over time graph show? Is it a linear relationship?
- * How does the increase in ocean acidity affect organisms that take refuge in shells? And how does it affect the organisms that depend on these animals for food?

Adapt

>For younger students

You can adapt the activity by replacing the hydrochloric acid with white vinegar or any other safe acidic solution and leaving the shells in the solution for a longer period. Students can perform Steps 2 and 4, while for Step 5, students can measure a shell daily and record the data in a table.

Step 6:

Record any changes observed in the shell's weight, colour, shape, and texture.

Step 7:

Discuss in your group:

- * What happened to the shell when it was dipped in the vinegar?
- * What happened to the weight of the shell over the course of the experiment?
- * What does the evolution of the variation in the colour, shape, and texture over time show?
- * How does the increase in ocean acidity affect organisms that take refuge in shells? And how does it affect the organisms that depend on these animals for food?

Further Resources

YouthXchange guidebook series: climate change and lifestyles - UNESCO Digital Library

unesdoc.unesco.org/ark:/48223/pf0000212876

Exploratorium - Ocean Acidification in a Cup

www.exploratorium.edu/snacks/ocean-acidification-in-cup

What is ocean acidification?

encounteredu.com/teacher-resources/frozen-oceans-geography-l4-l6-lesson-1

Eco-Schools Air Pollution Pack

www.eco-schools.org.uk/wp-content/uploads/2016/11/Air-Pollution-Teachers-Pack.pdf

Health and Air Pollution

www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution

Greenhouse Effect simulator

phet.colorado.edu/en/simulations/greenhouse-effect

Driving Green Change Through Organizations and Management Skills

To champion the green transition, organizations need a holistic perspective. Here's the roadmap:

1. Life-Cycle Management:

Look beyond the present. Consider the entire life cycle of products and processes.

2. Lean and Efficient

Operations:

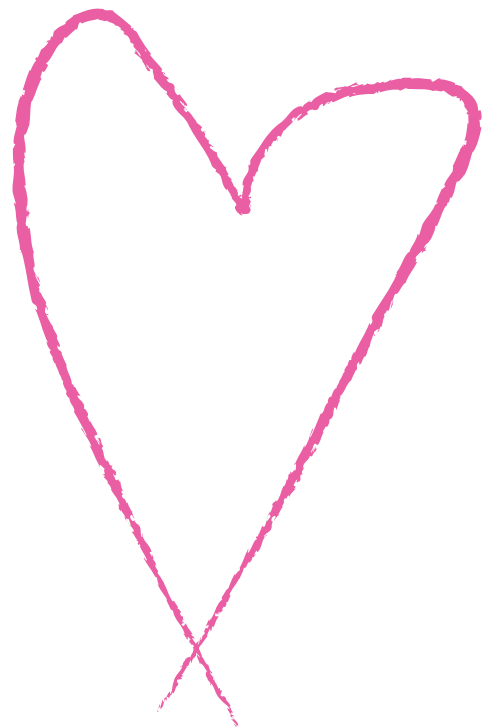
Streamline. Optimize. Waste less, do more.

3. Stakeholder Cooperation:

Engage both inside and outside the organization. Dialogue sparks action.

4. Management Skills:

Decode environmental data (think emissions). Then, weave eco-friendly practices into business strategies.



Skills that fit within this category:

- * Leadership
- * Decision making
- * Long-term planning
- * Lean management
- * Teamwork
- * Collaboration
- * Organisation
- * Interpersonal skills
- * Adaptability
- * Business Life-cycle knowledge
- * Communication
- * Operational efficiency

Jobs that fit within this category:

- * Sales Engineers
- * Climate Change Analysts
- * Sustainability Specialists
- * Chief Sustainability Officers
- * Transportation Planners
- * Environmental, Social and Governance manager
- * Sustainability manager
- * Biodiversity Specialist
- * Environmental Manager
- * Company Chief Executive Officer
- * Human Resources Manager
- * Procurement Officer
- * Marketing Manager/Creative
- * Project Manager
- * Operations Officers
- * Assistant Managers
- * Administrative Roles
- * Finance Officers
- * Entrepreneurs



Activity 1: En-ROADS Climate Simulator

Climate change is a threat that needs to be managed. Decision-makers implement policies to try and mitigate the extent of the problem.

The En-ROADS Simulator is a science-based model that predicts global average temperature change by 2100 based on variable you can control and change.. Use the simulator to facilitate group discussions and test out which parameters have the biggest impacts globally. You can find the En-Roads Simulator here:

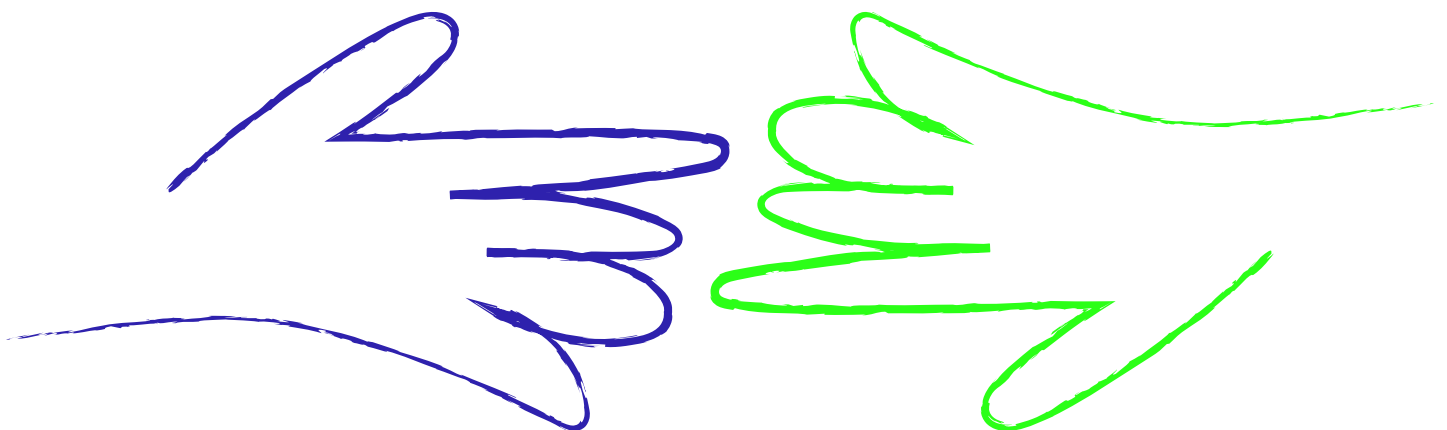
<https://en-roads.climateinteractive.org/scenario.html?v=24.8.0&pl=l>

Time: 40 minutes

Age range: secondary school

Materials needed:

- * Computer
- * Projector
- * Speakers



Step 1:

Discuss climate change, what it is, and why it's essential to study it. Here's a quick summary from the BBC.



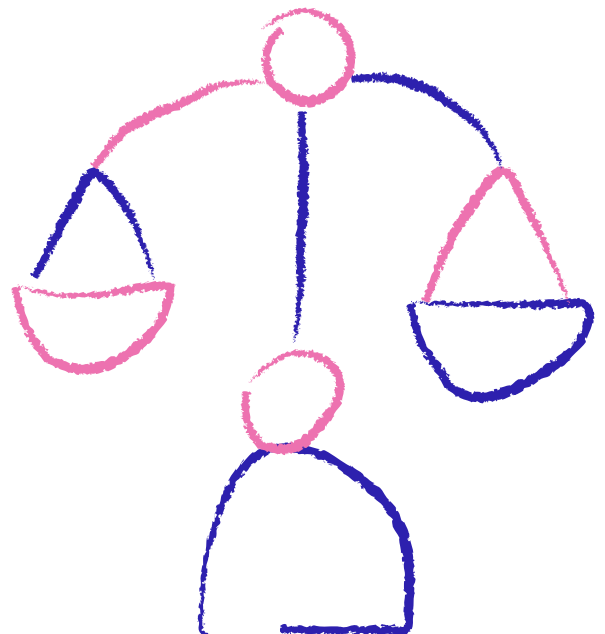
www.youtube.com/watch?v=YJrKgBUDGYc

Step 2:

Discuss what the Paris Agreement is. Does anybody already know? What are the targets set out in the Paris Agreement? (To keep climate change well below 2°C by 2100, and aim for 1.5 °C). Watch this video for a quick animation on the Paris Agreement:



www.youtube.com/watch?v=qfAeoBGS3Ek



Step 3:

What temperature is the world on track to reach by 2100? Discuss in groups/tables what variables must change to reach the 1.5°C target. Come up with the 4 most important and then feed these back to the whole class.

Step 4:

Input each table's 4 variables into the En-ROADS Climate Simulator. Did any of them reach the warming limit of 1.5°C? Why do you think this did or did not happen?

Step 5:

What new measures would you try? Identify other variables and change the simulation until you reach 1.5.

Step 6 (Optional):

Have each student go on a computer and try the simulation for themselves.



Activity 2: Introduction to Carbon Footprint for Young Students

Step 2:

Activities to acquaint children with climate change, the concept of carbon footprint, and the consequences of how we live our lives.

Use the BBC's food carbon calculator to evaluate the environmental impact of items in the school canteen.

<https://www.bbc.com/news/science-environment-46459714>

Time: 30 minutes

Age range: Primary School

Step 3:

Materials needed:

- * Computer
- * Projector
- * Speakers
- * Paper
- * Materials to draw

Design and draw your own Carbon hero. What do they look like? What superpowers do they have?

Step 1:

Watch the video for an introduction to carbon footprints.



youtu.be/hcj_EK82yNY?si=p2fFqPErGfslyV8

Activity 3: Using the C-ROADS Climate Change Policy Simulator

A roleplay activity where students represent different regions, implement policies for their regions, negotiate, and witness the implications of the resulting policy decisions.

Time: 1 hour

Age range: Secondary School

Supplies Needed:

- * Computer
- * Projector

Step 1:

Divide the class into 6 teams. Each team will be from one of the following regions: the United States, the European Union, United Kingdom, China, India, and other developing nations.

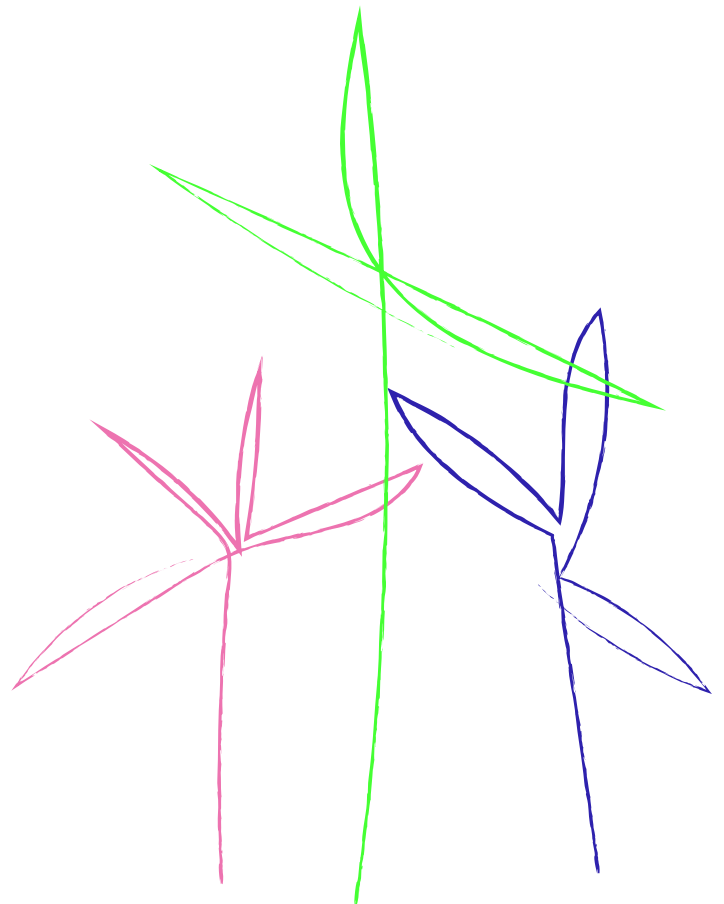
Step 2:

Using the [Information Pack](#), describe the simulation they will participate in using the 6-region slides. (Stop presenting on the 'Proposed Summary' slide and leave this up).

Step 3:

Hand out the information packs for each region and the proposal forms. You can find the information packs at:

(<https://img.climateinteractive.org/2022/03/6R-WCS-Materials-Quick-Download.zip>.)



For students:

Step 1:

Within your team, evaluate the information provided and decide what priorities your region has and what you are willing to pledge.

Step 2:

Nominate 2 people from your team to go around to the other regions and negotiate your cause. Discuss what other regions are doing and, representing your region, discuss mutually beneficial proposals.

Step 3:

Make notes in your team and prepare your final proposals. Collect the proposals and input them into the C-ROADS Simulator.

(<https://c-roads.climateinteractive.org/>)

For teachers:

Continue the slide show from step 2, completing the Debrief Session. Ask the students what they've learned. Did they meet the target? Why or why not? Do they feel they made the right proposal for their regions? What are the consequences of the resulting proposal for each region? Complete the slide show and encourage the students to think of the personal actions they can take.

Activity adapted from
(<https://www.climateinteractive.org/>)

Further Resources:

Net Zero game – make decisions for the world (individual activity)

(<https://ig.ft.com/climate-game/>)

BBC World Service Podcast –

(www.youtube.com/watch?v=bQYTEotCJw8)

Leading Accountability with Monitoring Skills

Leading accountability

These skills are used to observe variables and criteria.

Let's break it down:

1. Scientific Monitoring: Imagine being the environmental detective. You track changes, assess impacts—keeping our planet on track.

2. Compliance Check: Now put on your legal hat. Navigate technical standards, dance through legal frameworks. It's all about staying on the right side of the law.

www.nber.org/papers/w21116.



Skills that fit this category:

Data collection

- * Systematically gathering information from the environment using various methods and instruments such as sensors and cameras
- * Designing data collection protocols
- * Ensuring accuracy and precision in measurements
- * Recording meta-data (data about data) for context

Observation techniques

- * Carefully watching and recording environmental phenomena or wildlife behaviour without causing a disturbance
- * Keen observation
- * Identifying species and natural phenomena
- * Using scientific equipment such as binoculars, field guides and other aids for observation
- * Maintaining field notes and logs

Recording and reporting findings

- * Documenting observations and data in a clear and organised manner to communicate results effectively
- * Keeping detailed and legible records
- * Using appropriate formats for data entry, e.g. spreadsheets
- * Summarising data and findings in reports or presentations

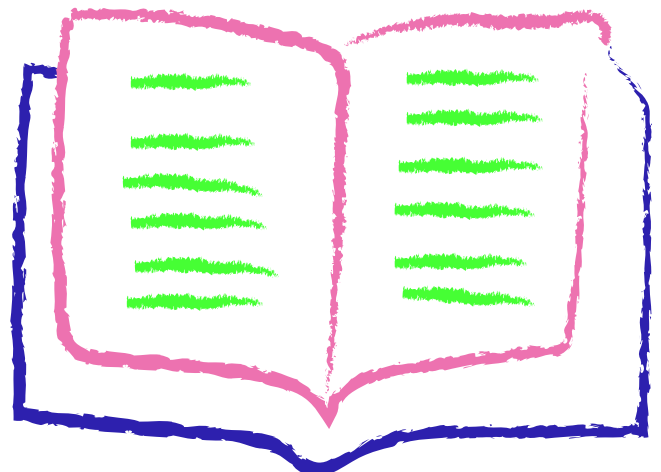
Using monitoring equipment

Understanding environmental indicators

- * Knowing signs and signals that can be used to assess the health of an ecosystem or the presence of pollution

Safety skills

Data management



Jobs that fit this category:

Wildlife Monitor

- * Track and record wildlife populations and behaviours to assess ecosystem health and species conservation status.

Air Quality Technician

- * Measure and monitor air quality to ensure compliance with regulations and to identify pollution sources.

Water Resources Technician

- * Collect and analyse water samples to assess water quality and manage water resources effectively.

Environmental Monitoring Officer

- * Conduct environmental monitoring activities to ensure compliance with environmental standards and regulations.

Meteorologist

- * Study and monitor weather patterns and atmospheric conditions to predict weather and climate trends.

G.I.S Specialist

- * Use Geographic Information Systems to map and analyse spatial data for environmental monitoring and planning.

Remote Sensing Technician

- * Operate and interpret data from remote sensing technologies to monitor environmental changes and manage natural resources.

Forest Monitor

- * Assess forest health, monitor deforestation, and manage forest resources sustainably.

Marine Monitor

- * Track and record data on marine ecosystems, pollution, and wildlife to protect marine environments.

Biodiversity Monitor

- * Assess and monitor biodiversity in different ecosystems to ensure conservation and sustainable use of biological resources.

Activities and Further Resources

Activity 1: Learning about the rules of the world

Rules, regulations, policies, laws and standards. We all have to abide by them, but what are they? This activity will have students researching different international standards.

Time: 1 hour

Age range: Secondary School

Materials needed:

* Computer or lists of standards

Step 1:

Ask the class what the differences between laws and standards are. After some discussion, explain that laws are rules created and enforced by a governing body, such as a government. They are mandatory and non-compliance results in penalties and sanctions. Standards, however, are guidelines or criteria set by organisations and industry groups to establish best practices and quality benchmarks. Adherence to standards is voluntary, but complying may be required for certification, and failing to comply can impact reputation and competitiveness. Confusingly, some laws may reference standards to provide a basis for compliance.

Step 2:

Does anybody know any organisations that set standards? Watch the below video:



www.youtube.com/watch?v=AYBVTeqKahk

ISO stands for the International Organisation for Standardisation. It is a worldwide non-governmental organisation of national standards bodies, with over 164 member countries.

Step 3:

In your team, research an international standard (ISO followed by a number) and explain what they mean and why you think they are important.

Step 4:

Present your standard to the rest of the class.

Step 5:

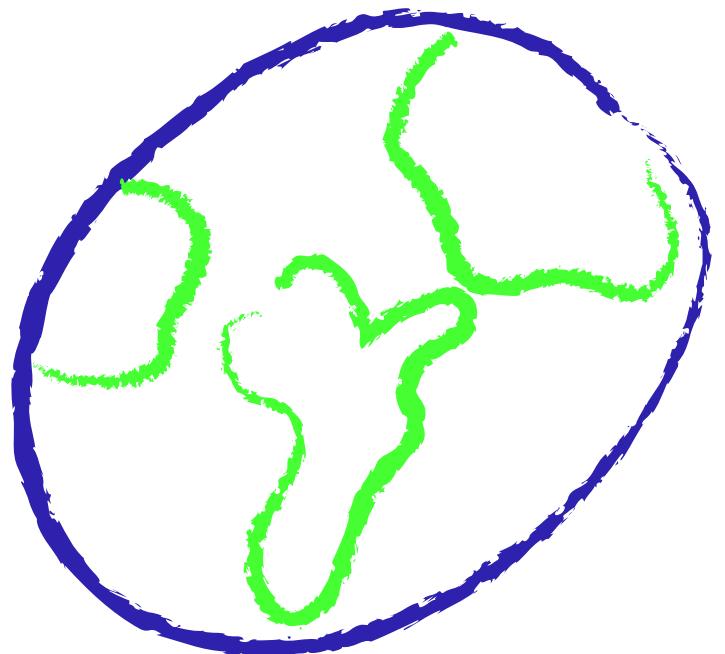
Within your team, discuss:
Are standards needed in addition to laws? Were there any standards that surprised you? Why? Why might standardisation be important for a green economy? Should standards be international?

Activity Adapted from:

<https://www.techtarget.com/searchdatacenter/definition/ISO>



Use this space for reflection and your personal notes



Sivi Sivanesan, Ecologist and Biodiversity and Landscape Manger for Kingston University

Why is it important to consider environmental impacts in the work that you do?

The work that I do is both a compliance related one, to make sure that the university's activities are not having a detrimental impact on both protected and non-protected biodiversity, as well as working to enhance and where possible, increase biodiversity, both on our sites and linked sites. To do this properly, the impacts of all of the different project at the university, be they development or maintenance work, or activities such as using our green spaces for forest school activities etc. all of which have an impact on the environment, have to be looked at, checked and adapted to remove or minimise the impact.

What would say to your 5-year-old self about studying/working in relation to the importance of green skills ?

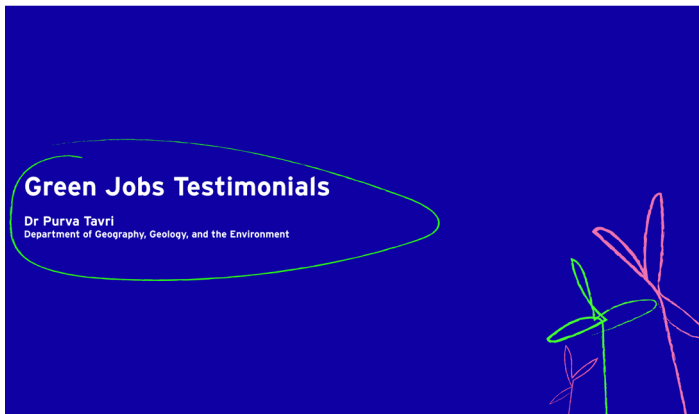
Take the opportunities (if you have them) to experience different activities and find out what you love to do. It may not be what you think you'll like or be good at. Once you try a range of things, work to get the experience in those from a young age and with different people. Networking does matter, regardless of your background and being able to do the work well, so make sure that you surround yourself with people who are working in the field that

you want to work in, as that all helps find those chances and experiences that help you decide what work or studies may be the best fit for you. Unfortunately the sector is one which is not supported by society, so it's largely reliant on volunteers and funded work which only lasts 3-5 years before having to apply again for work, so it may not feel the most stable of sectors, and it will likely remain that way while society pays lip-service to how important wildlife and nature is, but doesn't value it enough to pay those who are working to protect it properly. This in part does lead to what is perceived as a lack of engagement with minority groups or those less affluent, but don't be put off of working or studying biodiversity or nature conservation because you think it's not for you as you can't see people who represent you in the media etc. we may not be in the mainstream media channels, but we are there in every area of biodiversity work from research to boots on the ground – you just might have to look a little harder at times.

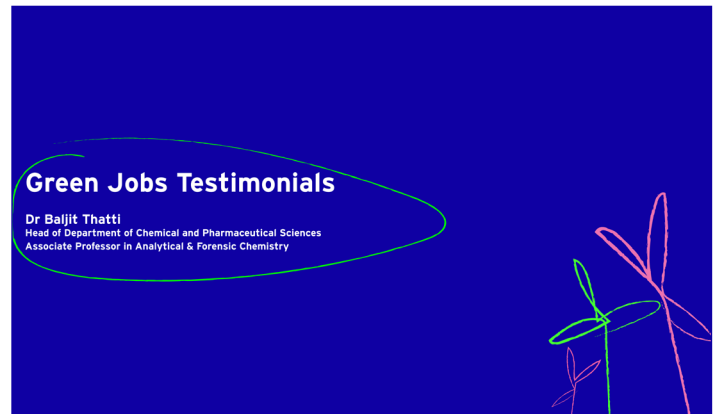
I'd also say that while there are so many new technologies that are coming out, that means that the next generation of those who are studying or working in the environment will have new tools that they will have to get experience in, when it comes to nature, it all comes back to the basics, look properly to see what is there, not what you think is there – the more you look, the more you see.

Insights from the Field

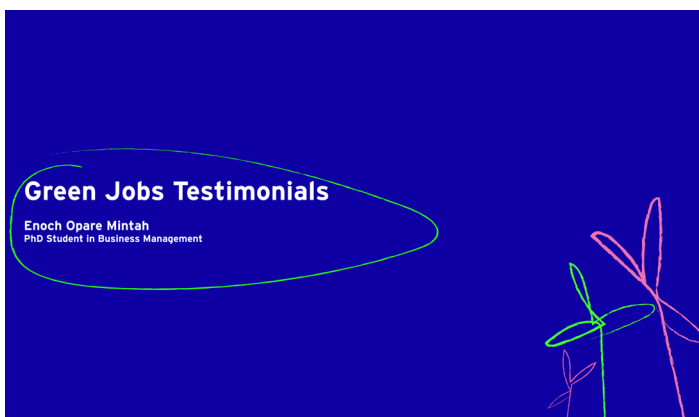
Click on each image to watch a testimonial



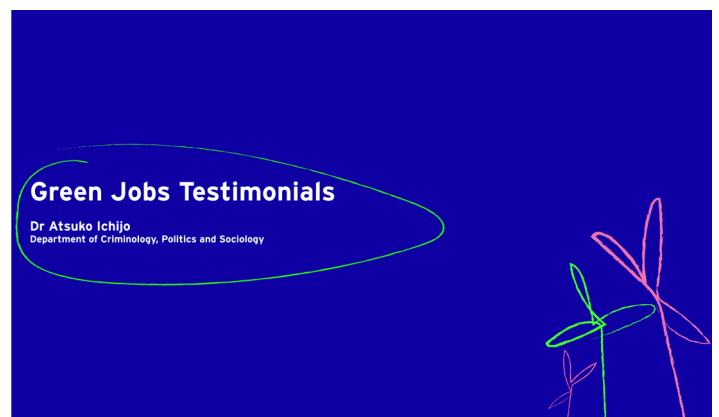
Dr Purva Tavri - Lecturer in Environmental Management



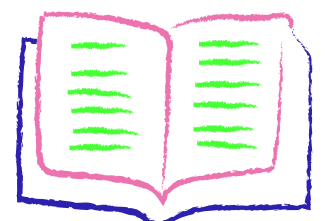
Dr Baljit Thatti - Head of Department of Chemical and Pharmaceutical Sciences
Associate Professor in Analytical & Forensic Chemistry

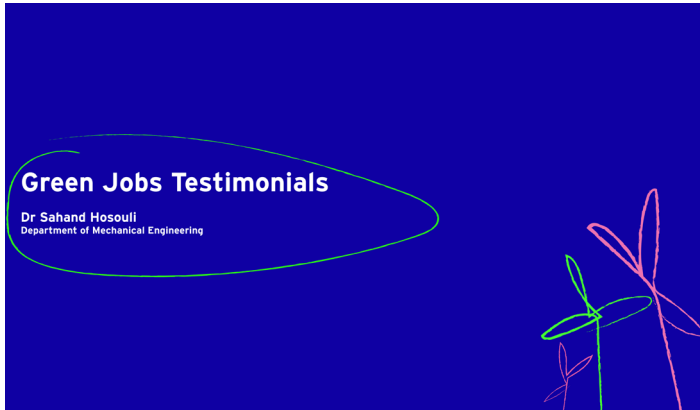
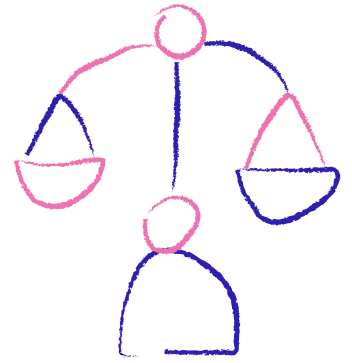


Enoch Opare Mintah - PhD Student in Business Management

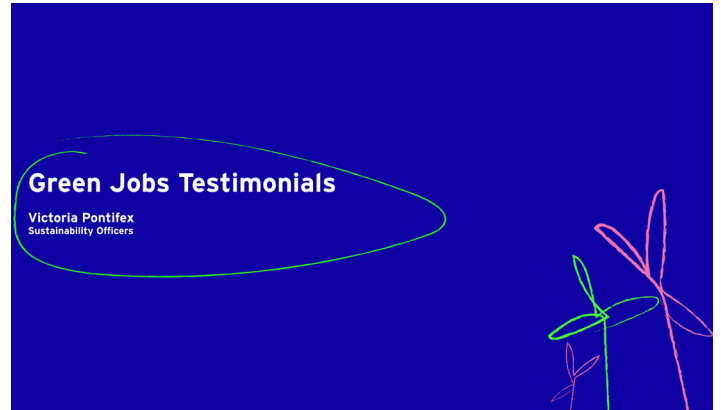


Dr Atsuko Ichijo - Associate Professor in Sociology

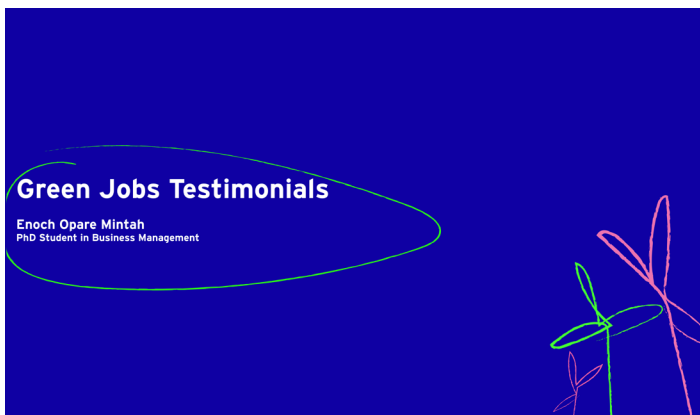




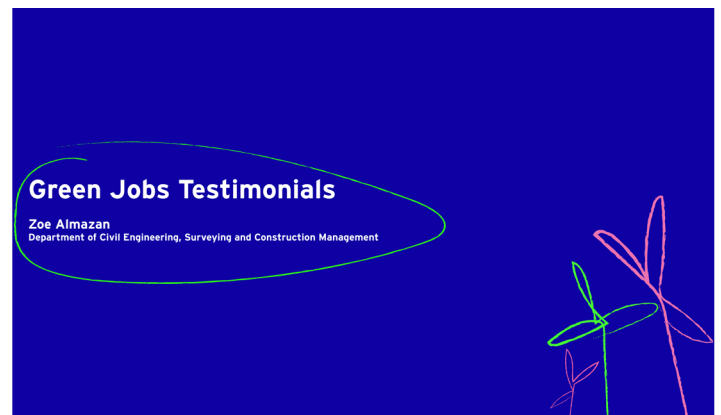
Dr Sahand Hosouli - Department of Mechanical Engineering



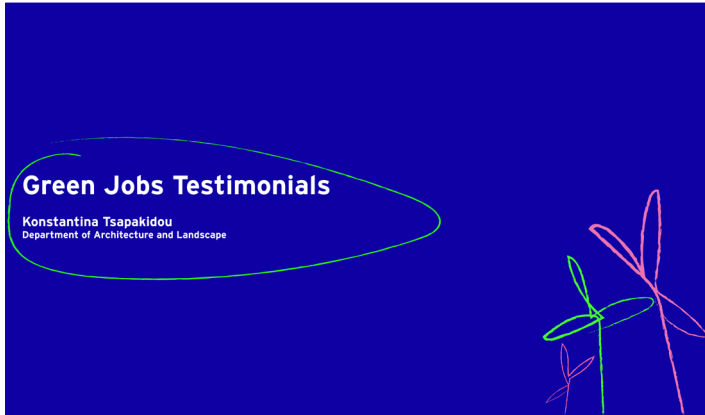
Victoria Pontifex - Estates and Sustainability



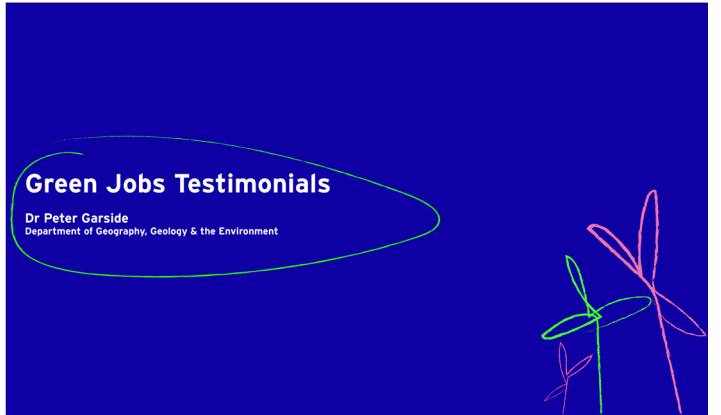
Anthony Eneremadu - Applications Analyst



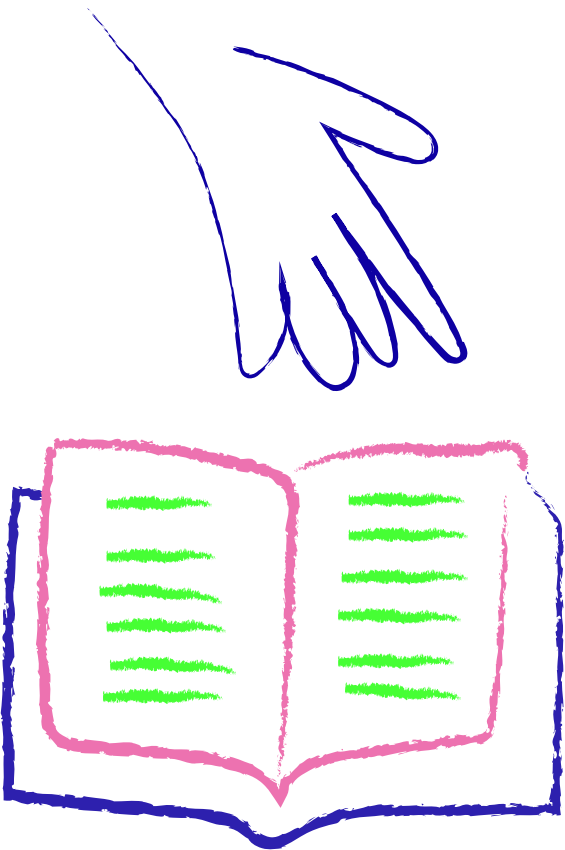
Zoe Almazan - Senior Lecturer in Building Surveying



Konstantina Tsapakidou - Department of Architecture and Landscape



Dr Peter Garside - Department of Geography, Geology & the Environment



Use this space for reflection and your personal notes



We hope you find this toolkit helpful.
It was made by students for students!

If you would like to get involved or
share your activities, please complete
this form:

<https://forms.office.com/e/jahQu8t95j>

or use the QR code



Green skills activities and other examples

To see other activities, use this link:

https://kingstonuniversity-my.sharepoint.com/:f/g/personal/ku5995l_kingston_ac_uk/EvrVKyHLTWBELTSmpZKMLeoBP0noN6bCd_RclXnpoQtBVg?e=Fsit9g

or use the QR code



To learn more about Sustainability
initiatives at Kingston University, click
here:

<https://www.kingston.ac.uk/sustainability/>

