

# INVESTIGATIONS

## THE GLOBAL ISSUE OF PRODUCTION, CONSUMPTION AND WASTE

The global increase in population and living standards has been accompanied by an increase in resource extraction, consumerism, disposable products and waste generation. Humans are now consuming resources at greater rate than can be generated by our planet. If we want to live more sustainably, then we need to understand how our lifestyle choices impact the world around us and find ways for everyone to both live well and have a smaller ecological footprint.



Moving towards a sustainable production and consumption system, a circular economy, is underpinned by three principles: design out waste and pollution, keep products and materials in use, and regenerate nature. Stimulate class discussion with a video: *Explaining the Circular Economy and how society can re-think progress* (search for it on YouTube). For references and further reading, see page 22.

**Ask students to:** investigate the market size and volume of waste generated by a product that they use in their everyday life (e.g., mobile phone, t-shirt, chocolate). Possible questions:

- What resources are used to make this product? How sustainable are these resources?
- Research and graph the changes to the product or packaging size over time (volume or weight).
- What factors have influenced the increase in production quantity? Research and graph the data on the changes in production quantity over time.
- How has the cost changed over time? How would you display this graphically?
- How long does the product last? What design factors influence product longevity and environmental impact?
- How is the product, or its components, disposed of? How much material is reused or recycled? How much waste is generated? What volume of landfill is needed?
- How could the product be redesigned to reduce waste and pollution? Design your own packaging. Include scale drawings and all measurements.
- What conclusions can you draw from your mathematical investigations?

## POSSIBLE CURRICULUM CONNECTIONS

**Year 7:** Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies (VCMNA248) Investigate, interpret and analyse graphs from real life data, including consideration of domain and range (VCMNA257)

**Year 8:** Solve problems involving the use of percentages, including percentage increases and decreases and percentage error, with and without digital technologies (VCMNA276) Plot graphs of non-linear real life data with and without the use of digital technologies, and interpret and analyse these graphs (VCMNA285)

**Year 9:** Explore the connection between algebraic and graphical representations of relations such as simple quadratic, reciprocal, circle and exponential, using digital technology as appropriate (VCMNA339)

**Year 10:** Explore the connection between algebraic and graphical representations of relations such as simple quadratic, reciprocal, circle and exponential, using digital technology as appropriate (VCMNA339) Solve problems involving surface area and volume for a range of prisms, cylinders and composite solids (VCMMG343) Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data (VCMSP354)