



## Challenge one: Science and the Food of the Future

*What will we be eating in 100 years? How can science be used to support sustainable food production? How can we eat more healthily and more sustainably?*

Our current agricultural systems cannot sustainably and effectively feed everyone. Growth in population and income is creating an ever increasing demand for food. At the same time agricultural production is limited by the increasing scarcity and diminishing quality of land and water resources. According to the WHO (World Health Organization) approximately 30% of the global population is malnourished.

**Projects looking at the Food of the Future should focus on how technology could improve sustainable food production and/or food security.**

**Use one of these project ideas or come up with your own:**

- Design a vertical farm to help preserve habitats
- Investigate whether we grow food without soil
- Can crops be made more nutritious?
- Is there such a thing as a closed loop farm?
- Invent food additives to make food last longer and reduce food waste
- Does meat grown in a lab produce less greenhouse gases?

### Find out more

- **The future of food and agriculture (FOFA)**  
<http://www.fao.org/publications/fofa/es/>
- **Food safety in the EU** [https://europa.eu/european-union/topics/food-safety\\_es](https://europa.eu/european-union/topics/food-safety_es)
- **World Food Programme** <https://es.wfp.org/>
- **Tech Food Magazine** <https://www.techfoodmag.com/>
- **Food Innovation Programme** <http://foodinnovationprogram.org/>
- **Cómo reducir los desechos de alimentos**  
<https://www.sdgfund.org/es/c%C3%B3mo-reducir-los-desechos-de-alimentos>

***Still stuck? Try brainstorming ideas about growing food in disused spaces.***



## Challenge two: Technology and Social Change

*How can technology be used to create positive social change in our society, communities and neighbourhoods?*

All across the world, technology is being used for social change. Apps to build communities around civic participation are particularly popular, but there are also many initiatives tackling problems like gender violence, environmental damage, and poverty.

Some projects provide information, some enable people with similar views to connect, and others facilitate community participation.

**Projects looking at Social Change should focus on how technology can be used to create positive social change in our communities.**

**Use one of these project ideas or come up with your own:**

- Design an app to help connect people who want to make a community garden
- How could technology help homeless people find services available to them?
- Create a tool to educate people about what can be recycled
- Come up with a tech idea to promote positive body image

### Find out more

- **Tech for Good** <http://www.techforgood.global/>
- **A look at Tech for Good in Spain**  
<https://www.siceurope.eu/network/digital-social-innovation/look-tech-good-spain>
- **Tecnología para el Cambio Social**  
<https://makaia.org/es/proyectos/tecnologia-para-el-cambio-social/>
- **Tecnología para el cambio social (video)**  
<https://www.youtube.com/watch?v=Rkv-ReF1F2g>

***Still stuck? What issues are important to you? What would you like to change in your community? Try brainstorming ideas about how technology could help you.***



### Challenge three: Engineering and Cities of the Future

*What will our cities look like in 100 years? How can we use engineering to improve the design of cities in the future and make them accessible for everyone?*

Cities around the world are growing. More than half the world lives in cities, and by 2050, it is predicted to be two-thirds of the world population. Many people move to cities for work opportunities, but cities also provide lots of other amenities for their residents - museums, art galleries, restaurants, cultural facilities.

As more people move to cities, the infrastructure has to change to meet the needs of people. Cities around the world face increasing challenges to deal with - affordable housing, air pollution, energy, clean water, transportation, crime, traffic, waste management and more.

**Projects looking at Cities of the Future should focus on how innovation in engineering can improve quality of life in the cities of tomorrow.**

**Use one of these project ideas or come up with your own:**

- Design a school for a future city
- Design a public transportation system to accommodate a bigger population
- Come up with an idea to improve waste management in a densely packed city
- How will cities provide clean water for everyone in the future?
- Investigate how cities around the world are tackling traffic

#### Find out more

- **Ciudades del Mañana**  
[https://ec.europa.eu/regional\\_policy/sources/docgener/studies/pdf/citiesoftomorrow/citiesoftomorrow\\_final\\_es.pdf](https://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/citiesoftomorrow/citiesoftomorrow_final_es.pdf)
- **Ciudades del futuro: el máximo desafío de diseño**  
<https://www.unenvironment.org/es/noticias-y-reportajes/reportajes/ciudades-del-futuro-el-maximo-desafio-de-diseno>
- **From mega-regions to micro-size homes**  
<https://www.nationalgeographic.com/magazine/2019/04/see-sustainable-future-city-designed-for-people-and-nature/>
- **¿Cómo será vivir en las ciudades del futuro?**  
<https://www.lavanguardia.com/natural/20190617/462678309648/vivir-ciudades-futuro-smart-city-barcelona-brl.html>
- **Future Cities** <https://futurecities.catapult.org.uk/>

***Still stuck? Try drawing a city in 100 years. What needs to be different?  
OR try making a list of things you do every day. What city infrastructure do you use to get ready in the morning without even thinking about it?***



## Challenge four: Arts, Creativity and Sustainable Design

*How can we use creativity to make more sustainable products the most attractive option?*

Sustainable design seeks to reduce negative impacts on the environment by reducing consumption of non-renewable resources, minimizing waste, and create healthy, productive environments.

Sustainable product design is an approach that looks at efficient and effective solutions that uses more natural resources and reduces waste and toxins throughout the product life cycle.

In your project, you might like to focus an existing product that you use every day and think about how you could improve the design to:

- Decrease its carbon footprint
- Use more natural materials in the fabrication
- Make it reusable
- Make it recyclable
- Reduce over-consumption by making it more durable
- Reduce the transportation before the product reaches consumers
- Improve the packaging

### Find out more

- **UNESCO Green Citizens**  
<https://en.unesco.org/greencitizens/stories/sustainable-product-design>
- **Solidworks Sustainability**  
<https://www.solidworks.es/sustainability/index.htm>
- **Ecodiseño** <https://www.camara.es/innovacion-y-competitividad/como-innovar/diseno-sostenible>

*Still stuck? Try making a list of things you throw away every day, every week, every month and every year. How could they be made more sustainable?*



## Challenge five: Maths and Big Data

*How can we use data to predict problems and identify solutions in the future?*

As technology develops, we have access to more and more large data sets containing vast amounts of information. Mathematical techniques can be used to analyse data to reveal patterns, trends, and associations.

Many political and social bodies are using data to understand and solve some of the most important social and environmental problems of our time.

**Projects on the theme of Big Data should focus on gathering and analysing data to help identify and/or solve a social or environmental problem.**

**Use one of these project ideas or come up with your own:**

- Use data to facilitate car sharing to school
- Can data be used to predict and prevent illnesses and disease?
- Find out if data can help improve public transport routes
- How can we use data to minimise electricity consumption?
- Use data to analyse what waste your school produces and reduce it

### Where can I source data?

- SoGood<sup>2</sup>ata <https://sogooddata.org/>
- The European Union Open Data Portal (EU ODP) <http://data.europa.eu/euodp/es/data/>
- The European Environment Agency <https://www.eea.europa.eu/es>
- The European Data Portal <https://www.europeandataportal.eu/es/homepage>
- Or try collecting your own data by surveying friends and family.

***Still stuck? Conduct a survey in your class to find out about environmental behaviour change. Which things do people find most difficult to change? Can you come up with some ideas to help?***