Responsible Design & Innovation programmes of study: key stage 1 and 2

National curriculum in England

Purpose of study

Responsible design and innovation (RD&I) is a purposefully contemporary, rigorous and socially responsible subject. Using creativity and empathy, pupils design and solve real and relevant problems within a variety of sustainable and climate contexts, considering others' and inhabitants needs, wants and values before their own. They acquire the purposeful knowledge and tools to identify and learn specific information, drawn from a range of disciplines, and adopt a bias towards action when solutioneering. Pupils design risk out of problem solving, working resourcefully, show concern for environmental impact, and learn from the contemporary world of design and sustainable practices. Through iterative design and appropriate digital and physical prototyping, they develop the confidence to explore and adapt to ambiguous challenges that impact daily life within their local setting, in the context of global frameworks. High quality responsible design and innovation education forms the essential knowledge and experience pupils need to enact change to the products and systems around them, through responsible, economically viable, innovative and creative endeavour that ensures inclusive and ethical solutions.

Aims

The national curriculum for responsible design and innovation aims to ensure that all pupils:

- develop the creative, responsible, and practical expertise needed to carry out designing and problem solving with confidence, developing the ability to address real ambiguous issues related to climate and sustainability
- build and apply a repertoire of knowledge, understanding and expertise to research, data capture and ideate with people in order to develop viable solutions that evolve through valid digital and physical prototyping.
- learn to learn and draw from different disciplines in ways that achieve ideas that can be implemented, tested, or simulated.
- understand and apply the principles of circular economy to be able to critique the world they live in.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, expertise and processes specified in the programme of study.

Schools are not required by law to teach the example content in [square brackets].

Subject content

Key stage 1

Through a variety of creative and project-based activities, pupils should be taught the knowledge, understanding and expertise to engage in a design thinking process in order to develop responsible solutions. They should explore contexts related to their home, school, garden or playground, the local community, and wider local industries such as food and travel.

When designing and prototyping, pupils should be taught to:

Design purpose

- use research tools and methods to identify and describe problems.
- apply techniques that develop the understanding of the problems of others and draw out the strongest solutions.
- develop creative ideas that can be made and tested, that demonstrate a care for people and inhabitants
- develop and communicate to others design ideas, using digital or physical methods.
- draw inspiration from past and present design including circular design and biomimicry

Materials

- learn about existing materials through how they function, their aesthetics, and their environmental impact.

Prototype

- develop and communicate design ideas using CAD
- develop and communicate design ideas in physical ways including sketching and making models, prototyping kits, roleplay, and products made through cutting, shaping, and joining materials.

Responsibility

- understand and identify how people have positive and negative impacts in local communities, and ways to reduce the environmental impact of people

- learn how to reduce the impact of people in areas including food, fashion, transport, and energy.
- research into climate change and the actions being taken to address it both in the UK and more globally

Subject content

Key stage 2

Through a variety of creative and project-based activities, pupils should be taught the knowledge, understanding and expertise to engage in a design thinking process in order to develop responsible solutions with care for both people and the planet. They should work in a range of contexts relating to their community, groups of people by demography, and the local environment, in areas such as the home, school, leisure, culture, enterprise and industries including engineering, food, transport, energy and fashion.

When designing and prototyping, pupils should be taught to:

Design purpose

- use research tools and methods to identify and define problems and framing "how might we…" questions.
- apply techniques that deepen the understanding of the problems of others and draw out the strongest solutions in collaborative ways.
- develop creative ideas that can be made, tested, and improved, that demonstrate a priority for society and the environment
- develop and communicate to others design ideas, using digital or physical methods.
- draw inspiration from contemporary and historical design and engineering, and understand methods of circular economy that can be implemented to improve existing solutions and systems

Materials

- learn about existing and new materials through their purpose, characteristics, and their application, with understanding of how they are sourced, processed and have an impact on the environment.

Prototype

- develop and communicate design ideas in CAD
- develop and communicate design ideas in physical ways including annotated sketching, rough models and appearance models, functional prototypes, roleplay, electronic prototyping platforms, and products made through cutting, shaping, and joining materials.

Responsibility

- understand and identify how humans have an impact in their community, and ways to reduce human environmental impact both locally and globally using approaches drawn from the principles of the circular economy
- learn about the lifecycle of products in everyday life, relating to areas including food, fashion, transport, energy and industry.
- develop awareness of global frameworks aiming to respond to global challenges in a united way
- understand how scientific research is identifying challenges relating to the greenhouse, rising temperatures, changes to ecosystems, extreme weather, and how these appear in our local environment.