Proposed revision of the Design and Technology programmes of study KS1-3 – draft

22.04.13

Dear Colleagues

At the request of the DfE, the Design and Technology Association and the Royal Academy of Engineering as the host organisation of Education for Engineering (E4E) led the development of a revised version of the draft programmes of study.

This draft was submitted to the DfE on Monday 22 April 2013. It takes account of a DfE request that cooking and nutrition should be presented as a separate section within each key stage.

We are expecting the draft will change and improve over the coming weeks.

In preparing the document, a significant number of education and industry stakeholders within the design and engineering communities were consulted.

It has already attracted substantial support as a work in progress.

If you have not already done so, and wish to signal your support for the draft in a personal capacity and/or as an organisation, please email john.husbands@data.org.uk with your name, title and organisation by midday on 24 April 2013.

Yours sincerely

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Design and Technology

Purpose of study

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems in their own and others' lives within a variety of contexts. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. They evaluate past and present design and technology, developing a critical understanding of its impact on daily life and the wider world. Design and technology education makes an essential contribution to the creativity, culture, wealth and wellbeing of the nation.

Aims

The National Curriculum for design and technology aims to ensure that all pupils:

- develop the creative and practical expertise needed to confidently perform everyday tasks and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

Attainment targets

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

Subject content

Key Stage 1

When designing and making, pupils should be taught to:

- work in a range of relevant contexts, such as the home, school, gardens, playgrounds and the local community
- explore and evaluate a range of products
- create purposeful, functional, appealing products for themselves and other users based on design criteria
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology
- select from and use a range of tools and equipment safely to perform simple, practical tasks such as cutting, shaping, joining and finishing
- select from and safely use a wide range of materials and components, including textiles and construction materials, according to their characteristics
- evaluate their ideas and products against design criteria
- build simple structures, exploring how they can be made stronger, stiffer and more stable
- explore and use simple mechanisms, such as levers, sliders, wheels and axles, in their products.

When working with food, pupils should be taught to:

- *know the basic principles of a healthy diet and use these to prepare and cook simple dishes safely and hygienically*
- *understand where food comes from*
- *develop an interest in food and cooking.*

[This section has been discussed with food reviewers and D&T stakeholders and is not supported by all parties.]

Key Stage 2

When designing and making, pupils should be taught to:

- work in a range of relevant contexts such as school buildings and grounds, leisure and culture, the environment, enterprise and industry
- analyse and investigate a range of products
- use research and develop criteria to inform the design of innovative, functional, appealing products fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design
- select from and use a wider range of tools and equipment to safely and accurately perform practical tasks, such as cutting, shaping, joining and finishing
- select from and safely use a wider range of materials and components, including textiles and construction materials, according to their functional properties and aesthetic qualities
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- apply their understanding of how to strengthen, stiffen and reinforce structures
- understand and use simple mechanical systems in their products, such as gears, pulleys, cams, levers and linkages
- understand and use simple electrical systems in their products, such as series circuits incorporating switches, bulbs, buzzers and motors
- apply their understanding of computing to programme, monitor and control their products
- understand how key events and individuals in design and technology have helped shape the world.

When working with food, pupils should be taught to:

- *understand the principles of a varied, healthy diet and learn to prepare and cook a variety of dishes using a range of safe and hygienic cooking techniques*
- *know where and how a variety of ingredients are grown, reared, caught and processed*
- *increase their interest in food and cooking.*

[This section has been discussed with food reviewers and D&T stakeholders and is not supported by all parties.]

Key Stage 3

When designing and making, pupils should be taught to:

- work in a wider range of contexts such as engineering, advanced manufacturing, sustainable energy, health, the food industry and agriculture
- analyse the work of past and present professionals and others to develop and broaden their understanding
- use research and exploration, including the study of different cultures, to identify and understand user needs
- identify and solve their own design problems and understand how to reformulate problems given to them
- develop specifications to inform the design of innovative, functional and appealing products that respond to needs in a variety of situations
- use a variety of approaches, such as biomimicry and user-centred design, to generate creative ideas and avoid stereotypical responses
- develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer based tools
- select from and use specialist tools, techniques, processes, equipment and machinery safely and precisely, including computer-aided manufacture
- select from and safely use a wider, more complex range of modern and traditional materials and components taking into account their properties
- test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups
- achieve functioning solutions, considering material properties and the performance of structural elements
- understand how more advanced mechanical systems used in their products enable changes in the movement, size and direction of force
- understand how more advanced electrical and electronic systems can be powered and used in their products, such as circuits with heat, light, sound and movement as inputs and outputs
- apply computing and use electronics to embed intelligence in products that respond to inputs such as sensors, and control outputs such as actuators, using programmable components such as microcontrollers
- investigate new and emerging technologies
- understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists.

When working with food, pupils should be taught to:

- *understand and apply the principles of nutrition and health to achieve a varied diet*
- *understand the source and characteristics of a broad range of ingredients when choosing and preparing food*
- *cook a repertoire of meals and dishes to become competent in a range of safe and hygienic cooking techniques*
- *further develop a passion for food and cooking.*

[This section has been discussed with food reviewers and D&T stakeholders and is not supported by all parties.]