

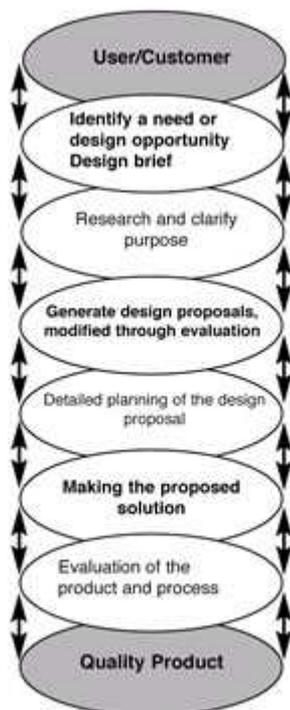
Supporting pupils learning EAL in Design and Technology

Contributing Author

Dawn Lama

This guidance is relevant for pupils learning EAL at Key Stage 1, 2 and 3, and is aimed at pupils at emergent, developing and consolidating levels of English language development. There has been very little written about D&T and EAL other than the DfES (2002) publication *Access and Engagement in Design and Technology*. The DfES (2005) CD Rom *Embedding ICT@Secondary Key Stage 3: Design Technology* also has some excellent video footage of good practice in supporting pupils learning EAL in D&T.

Design technology is seen largely as a practical subject that is easily accessed by pupils learning EAL which may explain why there has been very little written about the needs of EAL learners in Design technology lessons.



However as this diagram of the design process from the Design and Technology Association (DATA) shows, the practical aspect of a design challenge is only one small part of a process which requires the development and use of investigative, planning, and evaluative skills and depends very much on the effective use of language to communicate ideas throughout.

The QCA (2000) schemes of work for D&T have a strong focus on discussion requiring the use of predictive and evaluative language and structures throughout Key stages 1, 2 and 3. The schemes make increasing demands on the learner's use of language and pupils at the emergent, developing and consolidating levels of learning EAL will benefit from planned interventions and structures to ensure they develop the language skills they need to fully access the curriculum and produce work/portfolios at the appropriate level.

Teachers will need to recognise the benefits of pupils using their first language at all stages of the design process and should encourage their pupils to do so wherever possible.

At key stages 1, 2 and 3 the QCA schemes of work are divided into three areas and it is worth while spending time considering the language demands each area places on the learner so they can incorporate a language focus into lesson planning.

IDEAs (investigative, disassembly and evaluative activities)

These would usually be practical activities at Key stage 1 and 2 but would also provide good opportunities to introduce and/or reinforce vocabulary. EAL pupils will benefit from additional input so that they can begin to use the specific vocabulary at the outset of the topic, and also engage in the evaluative process.

FPTs (Focussed practical tasks)

During the FPTs pupils have the opportunity to try out some simple techniques such as making a lever or joining two materials together. At all 3 key stages there should be practical activities which will in turn build pupil confidence and support them for the DMA. They may provide opportunities to celebrate the achievements of pupils at the emerging stages of learning EAL. The expectation in terms of language would be to be able to feedback to a group or class about what they had been doing at key stage 1 or 2 but there will be an expectation for more formal and written presentations at key stage 3.

DMAs (Design and make assignments)

In the DMA pupils have the chance to put all their experiences together to meet a design challenge set by the teacher. There are considerable language demands throughout the activity but particularly at the planning stage where pupils need to be able to communicate their idea and say what materials they are going to use etc and what their design criteria will be. At the end of the activity pupils have to evaluate the finished design and explain what they think they have done well and how they could improve upon their design in the future.

The schemes of work for Key Stage 3 are similarly divided into three areas, PEAs DMAs and FPTs. The main difference is the PEA which stands for Product Evaluations Activities, and there is a greater dependence on using language for the evaluations of products, including research skills and presentation of findings, as well as the practical investigating and dissembling of products to build knowledge for the DMA. The language demands are significantly increased at Key Stage 3 as the actual making of the product becomes a lesser part of the assignment as a whole.

Strategies for supporting learners in the three areas of Design technology curriculum

The prior learning section of the QCA schemes of work for each unit of work is a useful starting point when considering activities for recently arrived pupils and an opportunity for activating prior knowledge. This section outlines the types of experiences the pupils should have had before embarking on the unit.

The examples could be used as pre-tutoring activities possible supported by a TA that would help pupils tune in to the concepts of the unit and come to the lesson with some understanding about the unit. For example pupils at key stage 2 who are going to work on the Making Toys unit would benefit from using construction kits to make models.

At key stage 3 pupils working on the unit Exploring Materials, Focus: food would benefit from activities such as classifying foods by their sources e.g. *animals, crops and plants produced organically, grown locally or imported using pictures*. The key stage 3 schemes of work all have a very useful section on language for learning which highlights the opportunities within the unit for enhancing pupils' language skills.

IDEA/PEA

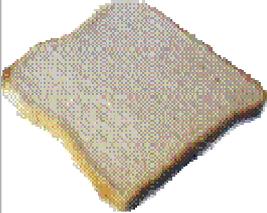
As stated earlier the main focus for EAL during this area is acquiring the specific vocabulary required for the unit. A simple way of approaching this is to produce a key word chart, ideally with picture support and where appropriate access to the words translated into L1. Google image search is an ideal way of sourcing high quality digital images of more or less everything, even abstract words and concepts.

Language games such as pelmanism, picture dominoes, or wall games can be used as starter activities or for small groups of learners.

www.babelfish.altavista.com/translation is a translation website supporting mostly European languages but also Chinese Japanese and Korean. www.foreignword.com has a wider range of languages.

For pupils at the emerging stages pupils the context of the investigation should be made as clear as possible, by the use of realia or pictures. For all learners it is good practice to include examples from a wide range of cultural backgrounds, for example pictures of cantilevered fishing nets in Goa for the Key Stage 1/2 units on levers and pivots

Wherever appropriate present information to pupils in a format that reduces the amount of reading or writing they need to use to access an activity as in the example below. The chart could be used after completion to engage the pupil in explaining there findings, e.g. 'What rating did you give the sliced white bread for texture', and thereby rehearsing the vocabulary they will need later in the unit.

Name	Texture	Appearance	Flavour
 Sliced white bread			
 Sliced brown bread			
 Flour tortilla			
Rating			

Using a writing frame

A Year 9 class has made clocks using plastic and metal as part of their work on resistant materials. They are expected to produce an evaluation of their product as a piece of continuous prose. A grid has been provided to structure the process and allow them to collect their ideas and form sentences prior to the extended writing task.

Evaluation of my clock

Choose one statement for each section		Choose words to make your sentence say what you want it to
My clock does what it is intended to do My clock doesn't do what it is intended to do	because	Faults – electrical/panel
My clock looks well made My clock doesn't look well made	because	Design/finish
My clock is/isn't durable	because	Good fit of base to case/material used
My clock is/isn't attractive and colourful	because	Variety of colour/brightness/size of face
I enjoyed the project	because	Used new skills Made something that works A challenge/easy Looked appealing
I liked/disliked the process (processes) of: soldering/vacuum forming/ researching/sketching/rendering/ assembling/problem solving ...	because	It was easy/difficult/a challenge/new ... It was awkward/dangerous ...
I have learnt about the process of ... So I had to use a		soldering iron/vacuum former/cooping saw/pillar drill ...
To improve this project I would		Research (greater depth/wider range) Better quality sketching Render work more carefully/ in more detail Faster/slower/organisation

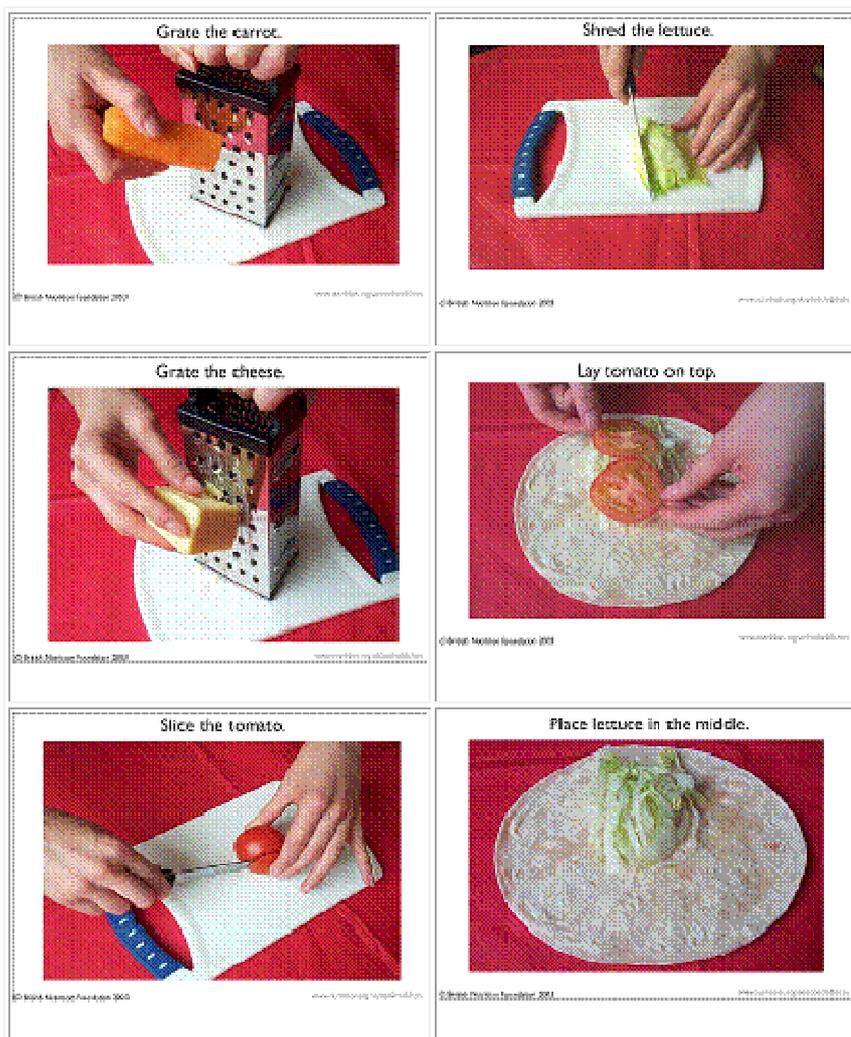
Consider also the use of group evaluations presented orally or by a nominated scribe rather than individual written evaluations

Focused Practical Tasks (FPTs)

Care needs to be taken when pupils are working on FPTs in Key Stage 1 or 2 that there are planned opportunities for speaking and listening to give EAL pupils opportunities to practise using the appropriate technical language. Again this could be done as feedback with pupils being asked to report back to a group or class about their task. There may be opportunities to focus learners' attention on a key grammatical feature such as the need for the past tense in reporting back, or indeed the types of structures common to the reporting genre.

Where possible the use of collaborative group work will make more language demands on the learner with an expectation of pupils to use the appropriate technical language of the unit. Challenging pupils to find out why something doesn't work is a good way of getting pupils to use language at a stretch.

Pupils may need simplified instructions supported by pictures and diagrams to help them access the activity. For pupils working on units related to food there are some excellent resources available on the British Nutrition Foundation website at www.nutrition.org.uk like these A5 size picture instructions.



Opportunities for focussing on the language of instruction will arise and supplementary activities could be developed such as sequencing or re-ordering instructions. For pupils at emerging and consolidating levels tasks should be broken down into small steps so that the instructions and key concepts can be staged to simplify the task as a whole.

Design and make assignments (DMAs)

There will be significant language demands placed on the learner throughout the DMA, with increasing expectations for written presentations of the planning, designing and evaluation process as the schemes progress through key stage 2 and 3. Pupils will benefit from careful planned support strategies throughout the activities, but particularly through the planning and evaluation process.

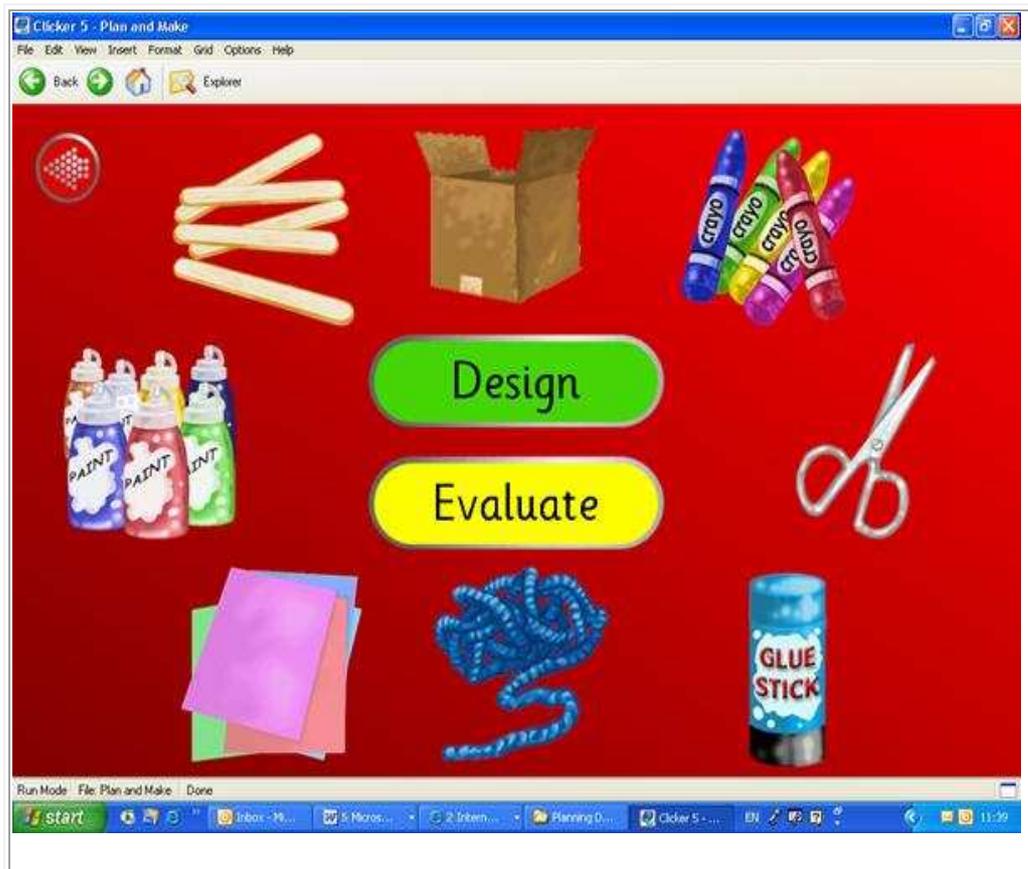
Planning

For pupils at the emergent stage of learning EAL the planning process can be very challenging especially if they have not had the opportunity of exploring similar products through the IDEAs and FPTs. For pupils at Key stage 3 the challenge will be even greater. Where possible consider adapting the unit to a context that is familiar to the learner, for example where the original unit is based around a culturally specific food product. Alternatively it may be

appropriate to ask them to 'adapt, improve, or add a new feature to the design of an existing project rather than 'invent' a whole new project."

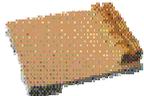
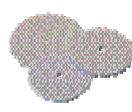
A key strategy for the planning process is to help children understand the importance of clear design criteria. If this is done then pupils will find the process of evaluating their product is easier because they are assessing it against well defined design criteria. Pupils should be encouraged to draw on their experience in the IDEA and FPT for the unit when creating design criteria.

There is a wealth of ready made worksheets available to for the design of products. The better ones will act as a frame that will support emergent learners through some linguistically challenging concepts. Software such as Clicker 5 (www.cricksoft.com) can be used to support learners through the use of the speech and clear graphics.



This set of grids provides pupils with pictorial support for the selection of resources as well as giving sentence starters and endings for them to generate their own sentences about their design.

Another way to do this is to create 'picture boards' using clip art or photographs which could be laminated and used as a resource for both identifying the resource and spelling.

					
scissors	wipe	hack saw	tube cutter	plastic tubing	card
					
hack block	drawing	string	split pins	sellotape	zip closure
					
crayons	junk materials	card sheets	PVA	double sided tape	cotton reels

Throughout the DMA, particularly at Key Stage 3, pupils will benefit from frequent opportunities to engage in speaking and listening activities that give them time to rehearse new language and structures before they are expected to present them in written form.

Evaluation

For pupils at the early stages of learning English the process of evaluating their work will be very challenging and they will need the task to be structured to help them do this. Strategies include doing whole class or group evaluations with a nominated person to feed back or scribe, using closed questions based on simplified language or using visual representations such as smiley faces. The example below highlights the benefit of having clear design criteria from the outset.

Design Criteria	Evaluation		
My design has a moving part controlled by pneumatics			
My design works properly each time			
My design frightens and surprises people			

Pupils at the developing levels could be given writing frames which provide sentence starters and endings

I could improve my design	by	making it more colourful Making it bigger Using stronger card
----------------------------------	-----------	--

The use of ICT in D&T can have enormous benefits for pupils learning EAL and many of these benefits are exemplified in e-portfolios. These are electronic teaching resources “using presentation software, for the teacher to use to present classroom activities to support designing and making processes, and also an electronic workbook for the pupil”. For pupils learning EAL e-portfolios can:

- Provide spoken text to support reading
- Allow pupils to re-visit ‘skills’ guides as required

- Support independent working
- Offer an alternative to purely written work

Design and make a soup or a salad to encourage more fruit and vegetables




I made a: Salad
 Soup



My recipe is called: _____

This is a photograph of my dish.

Insert photo here

Inspiration for my dish came from:



Encouraging more fruit and vegetables

Sample e-portfolio slide

There are secondary and primary examples on the DATA website

http://www.data.org.uk/index.php?option=com_content&task=view&id=148&Itemid=343

Contributing Author

Dawn Lama

Published

24 April 2006

Last updated

2 May 2009

References

Design and Technology Association (undated) secondary ICT. Retrieved 24th April 2006 from <http://web.data.org.uk/data/secondary/index.php>

DfES (2002) *Access and engagement in Design and Technology: Teaching pupils for whom English is an additional language* London: DFES , 0658/2002.

Qualifications and Curriculum Authority (2000) *Design and Technology at Key Stages 1 and 2* London: QCA .

Qualifications and Curriculum Authority (2000) *Design and Technology at Key Stages 3 and 4* London: QCA .

Useful websites and resources

British Nutrition Foundation <http://www.nutrition.org.uk/home.asp?siteId=43§ionId=s>

Coventry City Council (2005) '*Design Technology & English as an Additional Language*'
Resources to support the exemplar QCA scheme of work for Key Stages 1& 2. CD Rom.
Available from sue.wheeler@coventry.gov.uk

Design and Technology Association <http://www.data.org.uk/> and the Primary Design and
Technology Association <http://www.dandtprimary.org.uk/>

First published

20 April, 2007

Last updated

16 March, 2012