

Are we getting it right?

Design and technology from primary to
GCSE

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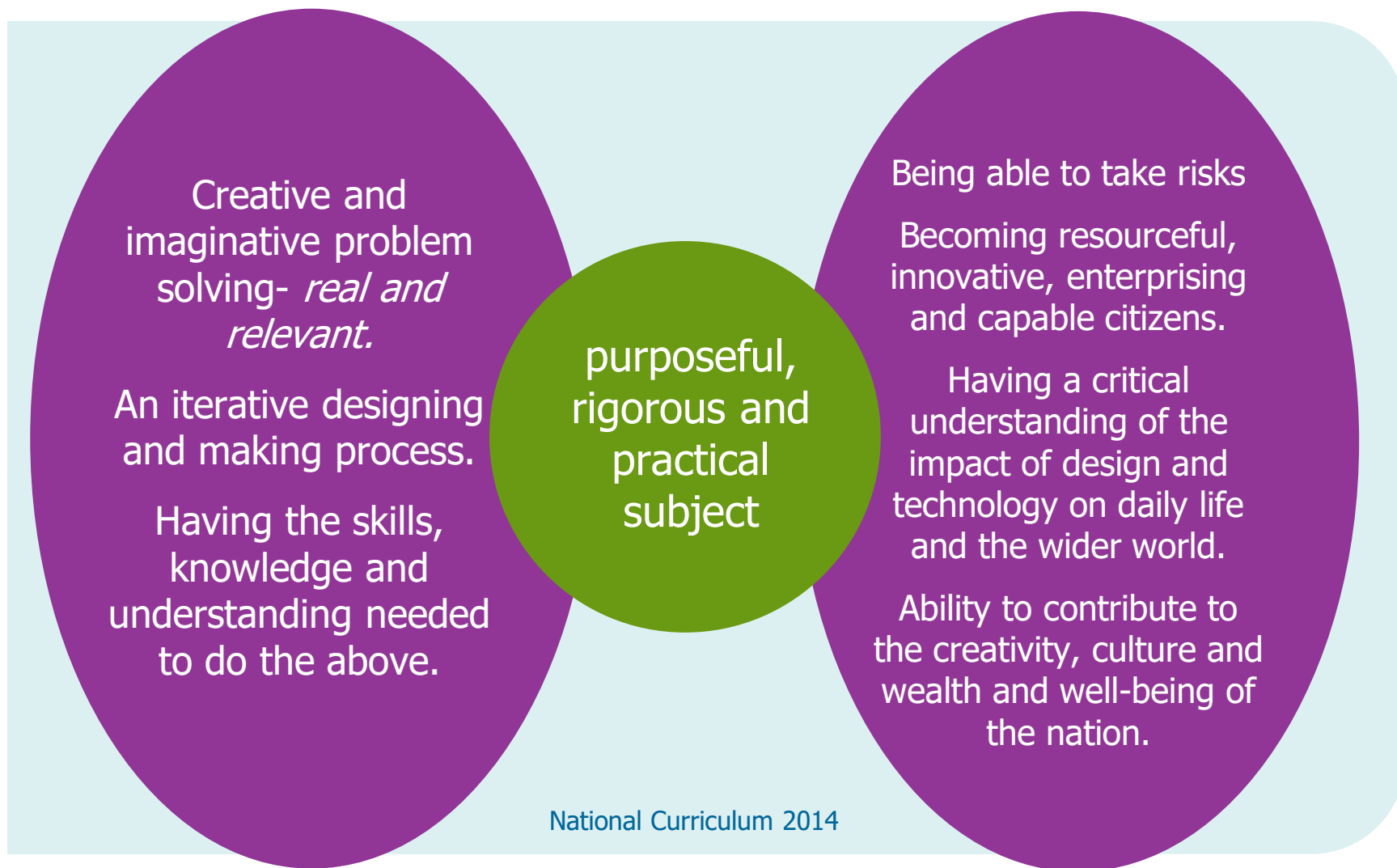
National Lead for Design and Technology

8 July 2016

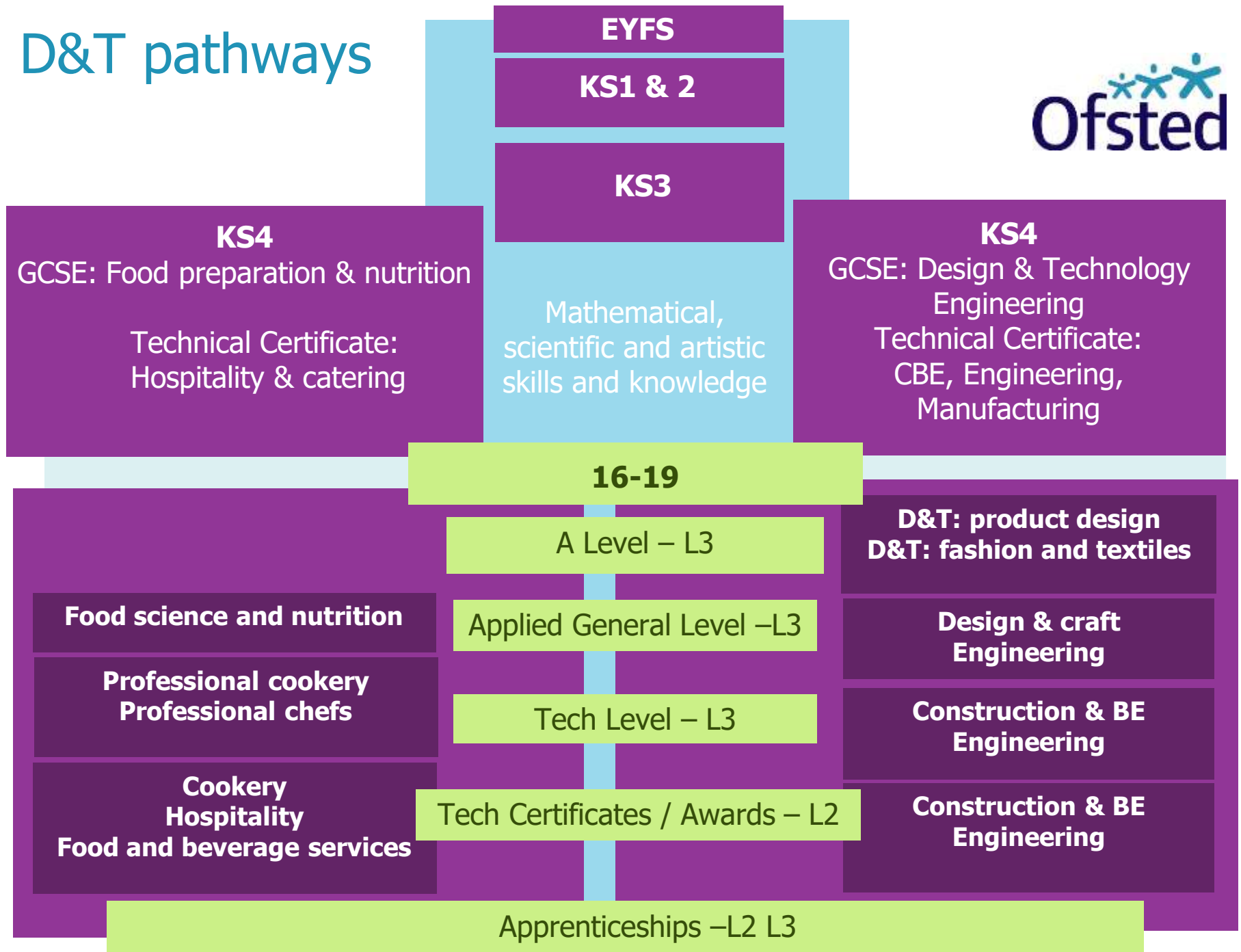
Context



National Curriculum 2014



D&T pathways



Primary



Gathering evidence about primary D&T

Method

- Survey of primary schools, all currently judged good or outstanding. 16 completed responses out of 20 contacted
- Ofsted design and technology network set up of design and technology inspectors with D&T or related expertise
- D&T network members gathering information from inspection

Emerging findings – curriculum coverage

- Opportunities to learn about key events and people that shape the world, typically a strength. – although mainly Victorian era or earlier
- Designing for a context- Strong examples from great egg races to 'reading buddies' – but only from half the schools surveyed
- Iterative design- Most schools had some good examples of opportunities for pupils to design. However, often the design brief requires a solution that cannot be realistically tested. Also, historical model-making often misnamed as design.
- Mechanisms - use levers, pulleys, axles common place, syringes rarer– not always clearly linked to designing

Emerging findings – curriculum coverage

- Electronics- plenty of use of bulbs and motor circuit construction, but quite often not applied to a design context.
- Applying computing to program, monitor and control pupils' own designs – Computing clearly evident but in most cases not linked with D&T projects. Several schools described this as a next step.
- Computer aided design – only one third of schools used it. Some cited lack of resources as a barrier.
- Development of mathematical thinking – many opportunities to measure, weigh, determine quantity and use scale. However, opportunities for pupils to work out the measurements for their own designs not so prevalent.

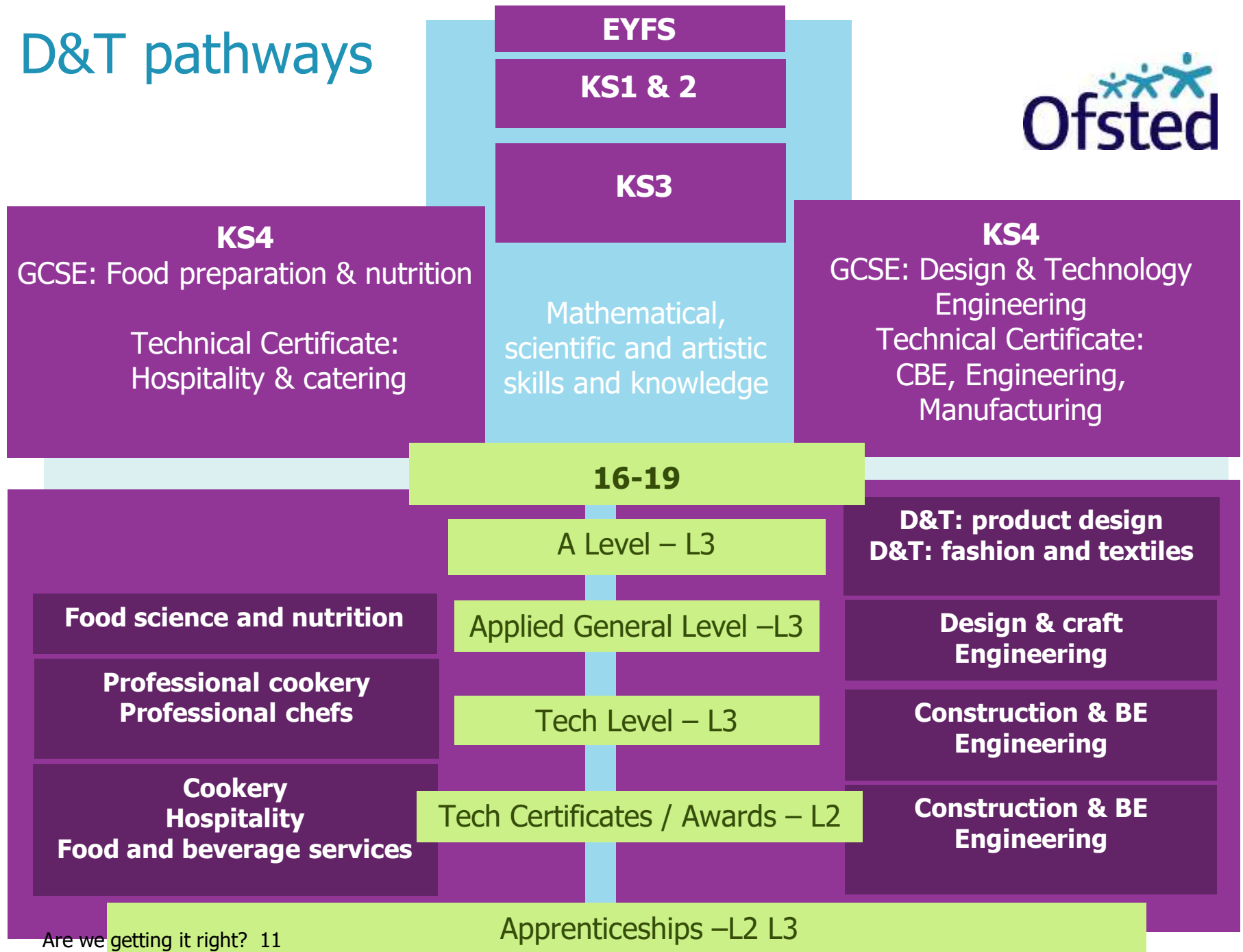
Emerging findings

- Thematic curriculum driven by knowledge subjects such as history often results in limited opportunities to design products for a 'real-life' contexts.
- School leaders typically plan for curriculum coverage but not necessarily for how each project will build on the last.- Often too little attention paid to developing specific design and communication skills. Much D&T often dedicated to making without designing for a 'real life' context.
- Assessment not well developed. Lack of clarity about how well pupils should have grasped particular skills and knowledge by the end of each period of learning or project.

Secondary



D&T pathways



D&T GCSE changes implications timeline

	2015-16	2016-17	2017-18	2018-19
Yr7	National curriculum or other curriculum that prepares pupils for new GSCSEs			
Yr8	NC 14 or other curriculum that prepares pupils for new GSCSEs If choosing GCSE options these must be New Food GCSE or New D&T GCSE- N.B. <i>New D&T specifications not yet available</i>			
Yr9	Options New Food GCSE or Existing D&T GCSE in RM, GP, EP, Te, S&C or PD – but not Food Technology	NC 2014 or other curriculum that prepares pupils for new GSCSEs Options New Food GCSE or New D&T GCSE		
Yr10	Existing D&T GCSE (RM, GP, PD, Te, S&C, EP and FT)	New Food GCSE- 9-1 Or Existing D&T GCSE in RM, GP, EP, Te, S&C, PD	New Food GCSE- 9-1 Or New D&T GCSE- 9-1	New Food GCSE Or New D&T GCSE
Yr11	Existing D&T GCSEs (RM,GP,PD,Te,S&C,EP and FT) A*-G	Existing D&T GCSEs (RM,GP,PD,Te,S&C,EP and FT)- A*-G	New Food GCSE-9-1 Or Existing D&T in RM, GP, EP, Te, S&C, PD- A*-G	

Mind The Gap !

Implications of the new D&T GCSE



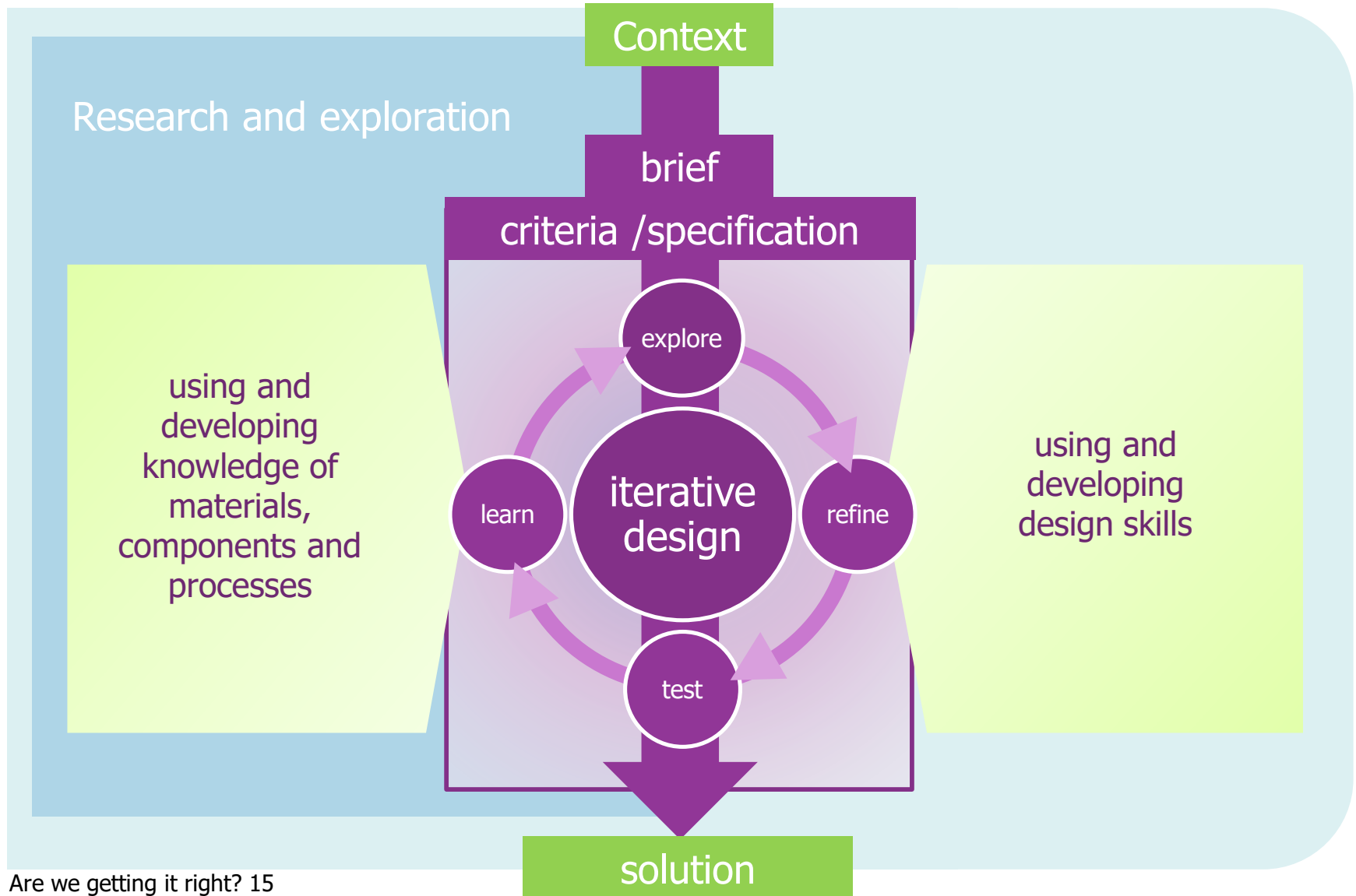
- Pupils at Key stage 3 should be studying a D&T curriculum that enables them to progress successfully on to D&T and Food preparation and nutrition GCSEs.
- At the heart of the D&T GCSE is the expectation that pupils will understand and apply iterative design processes through which they explore, create and evaluate a range of outcomes. Therefore pupils should be developing these skill at Key Stage 3 even if the school does not follow the National Curriculum.
- All pupils studying D&T GCSE will need to develop technical knowledge and understanding of how electronic systems and programmable components provide functionality to products and the function of mechanical devices. So key stage 3 should prepare pupils for this.

Implications of the new D&T GCSE



- Pupils will be required to produce at least one final prototype based on a design brief they develop in response to a contextual challenge set by the awarding body in the summer of year 10. It is unlikely that teachers will be able to set the same projects each year, which is often the case with the current GCSE.
- Pupils can select one material category for the production of their assessed prototype/s but will need a broader working knowledge of other material categories than in the existing GCSE.
- The separation of Key Stage 3 into separate subjects, e.g. Graphics, RM and Textiles becomes even less appropriate subject titles than previously as these subjects no-longer exist at GCSE.

Design and Technology is one subject



The current pupil experience

Typically:

- Key stage 3 divided in to the old GSCE areas despite these areas no longer existing for the GCSE current Year 7 and 8 will face.
- School leaders often opting for a two year Key Stage 3. This results in students either dropping D&T in year 9 or studying it in a narrower way, following a GCSE specification.
- Key stage 3 often very heavily guided making tasks with very limited opportunities to design in 3-d. Very few opportunities to engage in an iterative design process. When pupils make their own design decisions this is typically limited to surface decoration.

The pupil experience

- Design projects rarely include embedded technology- sensors, electronics, hi-tech fabrics, smart materials
- Food - not necessarily well focused on seasonality / savoury dishes, or enabling pupils to understand the principles of nutrition and health
- Carousel system results in silos. In-year progression not considered. Teaching typically enables pupils to meet the learning objective or success criteria set by the teacher, but this does not necessarily mean the pupils are making good progress in the subject.- *leaders not realising this*
- Key stage 3 summative assessment not sharply focussed in evaluating how well pupils are grasping specific skills and knowledge.

Further challenges of new GCSE



- Teachers often seeing themselves as teachers of textiles, resistant materials or graphics rather than teachers of design and technology. – *the need to teach more broadly therefore very daunting*
- Some teachers, understandably trying to fit the subject to their skills but potentially resulting in pupils not getting the right learning experience.
- Temptation by some to just avoid D&T and teach a vocational course whether it is right for the pupils or not.
- Teachings needing support to draw on and/or build skills and knowledge beyond their area of expertise
- care need to ensure teachers build confidence to enable pupils to explore materials beyond the teacher's original expertise-
collaboration between experts needed?

False divisions

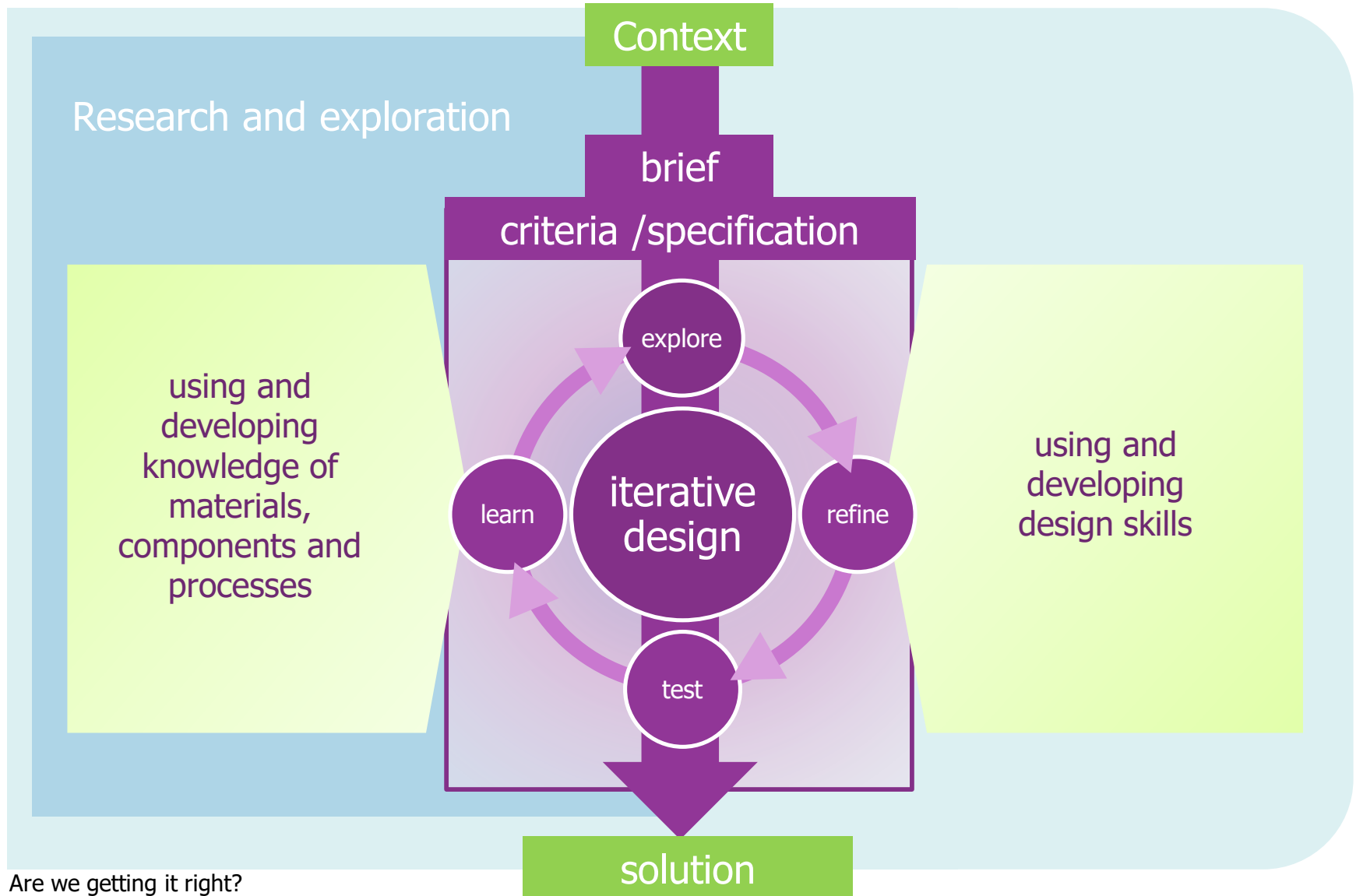


Moving forward



- Give it one name – *what are resistant materials and graphic products anyway? – nowhere but in school.*
- Focus on pupils' decisions about materials come through the design process not at the start. – *how often have you seen a task analysis that states 'my design must be made out of acrylic'?*
- Fine to, at times, restrict materials or components to engender creativity, provide focus and build learning- but need to ensure pupils are making genuine choices selecting materials that are fit for purpose.
- Start by ensuring all teachers are teaching design and technology, predominantly but not exclusively in the teachers' area/s of material expertise – branching out over time supported by suitable CPD opportunities.

Design and Technology is one subject



How will you know if you
are getting it right?



Are you getting it right in your school?



- Have the end of key stage or GSCE expectations been 'tracked backwards' to determine exactly what skills and knowledge pupils should acquire in each aspect of the subject in each year?
- Are teachers clear what would be good progress for pupils with different starting points and how this will be assessed? Do they know what pupils can and cannot do and teach accordingly?
- Does teachers' feedback help pupils make good progress?
- Does each scheme of work / topic build on the last and provide suitable challenge for the most-able pupils?
- If the school has to use a carousel system, does each teacher help pupils build on what they learnt with the previous teacher or are pupils expected to unnecessarily repeat previous learning?
- Do teachers have the CPD needed to keep up-to-date?

- Is the D&T curriculum mainly focused on an iterative design process – or on model making linked to history or geography?
- Are pupils designing for real-life modern day contexts?
- Do pupils get opportunities to apply their learning about electronics, mechanisms and programmable components when designing.
- Are design and communication skills explicitly taught?
- Do food teaching focus on predominantly savoury dishes?
- Does each D&T project enable progression from the previous one?
- Have leaders determined what will be assessed when and defined how the quality of pupils' learning will be evaluated? – e.g. how well have they grasped particular skills and knowledge rather than just covered them?

Key points: Secondary D&T



Do the schemes of work from year 7 onwards enable pupils to:

- Solve creative real life problems- derived from a context?
- Engage in an iterative design process?
- Develop an understanding of electronic systems and programmable components that can apply when designing?
- Develop and apply their understanding of modern and smart materials?
- Fully consider environmental and ethical implications?
- Fully develop their design concept, e.g. in textiles using a toile – *or are they just choosing a pattern and adjusting it when they make the final product?*
- Recognise the wide range of ways in which textiles can be deployed in product design?

Key points: Secondary food

Do the schemes of work from year 7 onwards enable pupils to progressively develop and apply knowledge of:

- principles of health and nutrition?
- functional and chemical properties of food?
- Food safety?
- Food provenance?

Conclusions



At the cross roads

- D&T as defined in the national curriculum and the new GCSEs is an exciting, rigorous subject highly relevant to pupils and society.
- When planned and taught effectively it contributes well to pupils progression in to a wide range of technical and creative careers as well as supporting pupils broader development.
- A range of pathways exist for pupils to progress on to post-16 which build on learning at key stage 4

At the cross roads

But...

- Considerable challenges ahead for primary schools.
- The key stage 3 curriculum in many schools is out of date and not typically preparing pupils well for GCSE.
- School leaders often do not seem to recognise the insufficiencies in their school's key stage 3 D&T curriculum.
- Serious concerns over whether teachers are equipped to teach the new GCSEs.
- A fixation on practical making skills above all else is stifling the subject and may be killing it.

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