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## Design and technology in England and France - a comparative study

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## DESIGN & TECHNOLOGY IN ENGLAND & FRANCE - A COMPARATIVE STUDY

**Webster R D**

Sir Bernard Lovell School

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### 1. Introduction

We, as teachers of Design and Technology in the UK should, more than any other subject teachers, feel tired, emotional and thoroughly 'picked on'. We are constantly reminded that, in comparison to our European neighbours, children issuing from English/Welsh secondary education are technologically illiterate. The spectre of a united Europe is upon us - our children will have to compete with chic foreign technocrats gliding effortlessly into every job worth having in the few British firms still operating in the face of European mega-efficiency etc! etc!. This is the nightmare - the reality is less extreme but there is no doubt that European children get, on balance, a signally better technological education than do ours. In this paper I propose to outline the similarities and, more significantly, the differences between our delivery of technology and that of French education.

In practical terms this research is based upon experience of Design and Technology education in two very comparable sites - the twin towns of Bridgnorth, Shropshire and Thiers, Auvergne. Both rural communities close to larger conurbations, with similar populations and schools of similar size catering for pupils of similar social mix.

### 2. Curriculum

The Technology component of the National Curriculum has only recently been formalised in England and Wales. In the introduction to Programmes of Study in the DES document we have :

'In each key stage pupils should design and make:

artefacts (objects made by people);  
systems (sets of objects or activities which together perform a task);and  
environments (surroundings made, or developed, by people);  
in response to needs and opportunities identified by them.

Contexts (situations in which design and technological activity takes place) should include the home, school, recreation, community, business and industry, beginning with those which are most familiar to pupils and progressing to contexts which are less familiar.

Pupils should be taught to draw on their knowledge and skills in other subjects, particularly the foundation subjects of science, mathematics and art, to support their design and making activities. These activities should also reflect their growing understanding of the needs and beliefs of other people and cultures, now and in the past.

As pupils progress, they should be given more opportunities to identify their own tasks for activity, and should use their knowledge and skills to make products which are more complex, or satisfy more demanding needs.

Pupils should be taught to take reasonable care at all times for the safety of themselves and others.

Pupils should be taught to discuss their ideas, plans and progress with each other, and should work individually and in groups.

At each key stage pupils should be given opportunities to work with a range of materials, including textiles, graphic media (such as paint, paper, photographs), construction materials (such as clay, wood, plastic, metal and food).

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A pupil who, because of a disability, is unable to undertake a practical activity required under the programmes of study, may undertake an alternative activity which most closely matches that activity.

Throughout these programmes of study, the term materials includes components, and the term equipment includes tools.

From the french 'Teachers Handbook' (a, thankfully, short form of the french core curriculum) we have:

## 1. Aims and objectives

The study of technology produces understanding and experience of the following thought processes:

Concept, study, realisation, testing and use of technical products (artefacts, materials, complex systems, organisation of information for a particular purpose). Also it allows understanding of the links between technology and society. Over and above these skills and knowledge technology, as part of the main body of education, should encourage understanding of the technological revolution, how it has affected a whole range of modern production techniques and the way in which technological change is related to social and economic change. The study of technology shows how knowledge is transformed into activity. In this way children discover that skills and knowledge continually develop in ways which are influenced by the perspectives and values of society. Children learn how to use the knowledge by way of making artefacts, they master the links between analysis, conception, realisation and "workshop practices" (refers to lathes, machines etc found in manufacturing industry). They find out for themselves about technical and technological developments and discover the world of work.

2. Strategies. Pupils should acquire the above skills and knowledge by way of projects organised by the College involving the realisation of technological artefacts. Such projects should begin by identifying a specific need, an end to be obtained and take into consideration all the influences and constraints experienced in achieving this.

Considerations in formulating such a project must include the following:-

Information gathering and organisation

Safety

New knowledge and skills to be acquired

Evaluation procedures and criteria to be applied successively throughout the project and finally in relation to the efficiency of the finished articles

Effective management of the time available

Project must be authentic and relevant to real world activities (domestic, craft, industrial or commercial). Technological activity presented as a series of projects runs a serious risk of appearing to be a discontinuous learning experience. Teachers must ensure, by reference to other fields of knowledge, and to broad cultural and technological trends that the technological knowledge of each project is set firmly within its context at the outset of each project.

All forms of technology cannot be taught in Secondary school - those which are are those held to be most relevant to major technical, social and economic changes.

No magic ingredient here then! Broadly speaking, we are covering the same ground and the same may be said for the rest of the DES document and the 'Teachers Handbook'. In France elements of what we used to call Home Economics are not included in Technology whereas I.T. is included and it is not organised in terms of levels of attainment but the same sort of considerations are applied in different ways.

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No, the difference between the two systems are not to be found in the policy documents but in the organisation, delivery and outcomes of the two curricula.

## 3. Organisation

The information given below in terms of grouping and movement is general for France but, clearly, not so for England and Wales where each school has its own ideas about grouping/setting.

Terminal qualifications in England/Wales nowadays are blissfully simple - GCSE Grade A - U plus 'A' levels. This is not the case in France as will be seen:

### 3:1 Grouping and movement in Bridgnorth

At Bridgnorth Endowed School pupils enter the First year at age 11 and progress through to year 5 in yearly increments regardless of ability. They are taught in mixed ability groups in the First year with withdrawal and in situ help for those in difficulties with English, Maths, French, Geography, History, RE and Science. Setting by ability is introduced around Easter in the First year in Maths, extended in the Second year and by the Third year all pupils are set by ability in all subjects. Help for those less able is available in all subjects through the learning support unit, again both in withdrawal groups and in the classroom.

All pupils in the First and Second years follow a common curriculum viz - English, Maths, French, Geography, History, Combined Science, RE, Music, Drama, Art, Technical Subjects (CDT, plus HE plus Needlework and PE). In the Third year German is introduced for pupils who wish to learn another language.

In the Fourth and Fifth years pupils follow a core curriculum consisting of English Language, English Literature, Maths, Religious, Social and Careers Education, and PE. In addition they choose from a number of options which must include at least some Science, one Humanities subject and one Technical, Vocational or Creative subject. Nearly all are entered for a full range of subjects at GCSE level.

Source - BES brochure 1988 - where appropriate, this has been updated.

There are no courses which specifically target less able pupils at BES though it is probably fair to say that a large proportion of them find themselves taking essentially vocational technical options in the Fourth and Fifth years. TVEI schemes provide a significant input in CDT and other areas.

### 3:2 Key to Equivalent terms in France/England

Probably the most consistently vexing aspect of this kind of research is the mental juggling act one has to continually perform in order to keep in mind the (inevitably) approximate equivalents in French and English education.

All English researchers agree that it is a damned nuisance - "for a supposedly logical nation the French persist in the illogical reverse numbering of their classes...." (Lewis 1985). I propose to outline those most important for comparison and those germane to technology in as short form as possible as this comparison is the crux of the paper.

1. Age/mixed ability. - Curious combination, but fundamental to an understanding of how French/English education may be compared. French secondary schools teach in mixed ability classes throughout the whole course of secondary education. BUT children who fail to reach the necessary standard in a given year may repeat that year - this happens in primary, secondary and tertiary French educational institutions. Thus a first year (6me) French class may realistically contain children aged 11 to 14, compared to an English secondary first form class of 11 to 12.

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This is the fundamental, never-to-be-forgotten factor in comparing the two systems - children in France progress through education by ability regardless of age and children in the UK progress through education by age regardless of ability. Thus it may be seen that where in England we have mixed ability classes the French tend to have mixed age classes of roughly similar ability. Pupils who successively fail to cope with the formidable workload of the French core curriculum will, at some point, move sideways into one of the other French secondary institutions, see below.

2. College d'Enseignement Secondaire - College of Secondary Education (also referred to as College and CES). This is the institution which most closely resembles the English secondary school in that it is concerned with roughly equivalent curriculum material and levels of attainment. This does not mean that, like English secondary schools it caters for the education of children between 11 years and 16 years (see above). However it is probably worth noting that the French College is always a secondary school unlike the English College which can be anything from a secondary school to part of a University.

No terminal qualifications are offered at a College - they are all awarded by the various Lycees or in the case of the least able, the Centres de Formation d'Apprentis (apprentice training centres.)

3. Lycees - there are three kinds of Lycees:

a) Lycee Generale - this caters for the elite graduates of the CES. It functions as something more than a Sixth Form College and less than a University and prepares pupils for the (justifiably) renowned Baccalaureat Generale (imagine a single qualification made up of five or six 'A' levels e.g. English, Philosophy, History/Geography, Science, Maths and a Foreign Language).

b) Lycee Technique - as above but with a very strong technical/scientific bias (timetable requirement 27 hours per week Maths/Science/Technology (including 12 hours practical Technology) plus 7 hours core curriculum). Figures given are for the Baccalaureat de Technicien F1 (Mechanics) source - Fiche ONISEP, July 1983.

c) Lycee d'Enseignements Professionnelle - College of Vocational studies (also LEP) - LEPs take pupils from the fourth year in College (ignore considerations of age - fourth year pupils in LEPs will be at least 14 and may be as old as 18) and tutor them in respect of the very specific and sophisticated range of vocational qualifications which are a significant feature of French education. It is within the LEPs that "Design" as we understand it (as a individual child's input to its own education) takes place as a structural element in Technology. Note: Pupils in a LEP tend to be late developers, the less able and the more able among those children identified as having formally recognised learning difficulties - CPPN (Classee Pre Professionnelle d'Niveau). The least able CPPN children remain in the CES where they are taught in an SES (Section d'Education Specialisee) this may be integrated within the College or, as in Thiers, housed in a separate building.

4. Year Numbering - some English researchers translate French year numbering into English (ie reverse it). I found this to be actually counter productive - it is easier to remember how different, eg in terms of age range a French first year class is from an English one if one has to convert first year into classee 6me or vice versa thus

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English Secondary School

1                      2                      3                      4                      5

French CES

6                      5                      4                      3

French Lycees Generals/Techniques

2                      1                      T

French LEP

4                      3                      2                      1                      T

(T = Terminale)

5. Qualifications - there is a bewildering array of qualifications which "children" (some could be in their 20s!) may receive at the (several) ends of the French education process. I have given here only the most important of those relating to technical/vocational studies - they are given in order of merit with (very) approximate English equivalents.

BTS Brevet de Technicien Superieur

HNC/D

Baccalaureat (BAC) Maths et Technique

)

BAC Construction, Mechanique

) 4/5 'A' levels

BAC Electrotechnique

)

BAC Technologique (may include Business Studies, Management etc)

)

) 'O'/'A' levels

BAC Professionel (Profesionel = vocational)

)

BEP Brevet d'Enseignement Professionel

)

CAP Certificat d'Apptitude Professionel

) Good GCSE

(both achieved via Technology courses)

)

CAP (via "Preparatory" classes)

Very specific vocational qualification = CGLI Craft Cert (ADV)

CAP (via "Contract d'Apprentissage")  
(Contains large element of work experience)

Part -  
apprenticeship

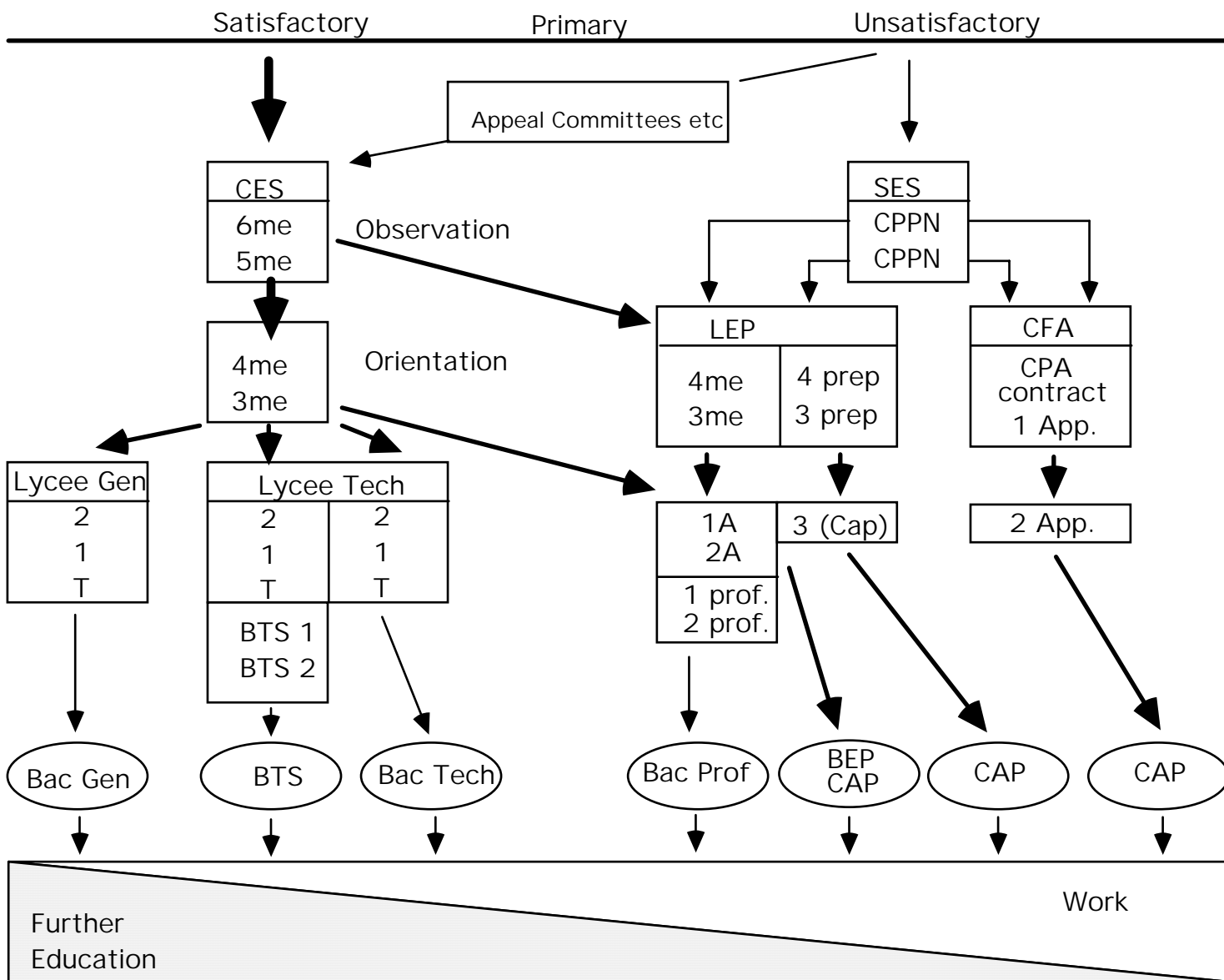
CEP (Certificat d'Enseignement Professionel)

Poor CSE

Although, in theory the pinnacles of French education are open to all children, realistically, late developers might gain a BAC Professionel but they would often be in their early 20s by then and most would have had enough of full time education.

Figure 1

Movement Through the French Education System (simplified)



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The BEP or one of the several CAP options is probably the best children with formally recognised learning difficulties could hope to achieve (probably in their late teens). The CEP is the least desirable alternative and although it is not mentioned in the research I have quoted in this context, one of my French colleagues (who taught children with learning difficulties) reckoned a superior option was the CEPprim. Certificat d'Etudes Primaires) essentially a primary qualification which guarantees the "child" to be basically literate and numerate.

6. Observation/Orientation - this is the process whereby a child's wishes, its parents wishes and the school's assessment are combined to determine its progress through the education system. Children who have reached a satisfactory level of primary education (who may be as old as 14) enter automatically into the classe 6me in a CES. Children of 14 who have not reached such a level in primary school will normally be assigned to a CPPN or a CPA - Classe Preparatoire a l'Apprentissage - in an LEP (children of less than 14 may not be educated in an LEP). In practice, less able children usually arrive at the LEP via the CPPN or the classee 5me of a College (see figure 1). The first cycle of observation takes place in classes 6me and 5me. Following this children may be pushed sideways into an LEP or continue in College for classes 4me and 3me in preparation for the Lycee Generale or Lycee Technique. Classes 4me and 3me of the CES form the Cycle D'Orientation - cycle of orientation. Choices open to pupils at the end of the 3me are essentially between the two types of Lycees - General and Technique (there are other specialised Lycees eg (Agricole). The Lycee Generale offers course with a strong classical/humanities bias teaching leading to the BAC Generale and (almost inevitably) to higher education. The Lycees Technique offer a larger choice of technical courses leading to the BAC Technique and on to the BTS Brevet d'Technicien Superieure - more than 80% of successful BAC Technique students at the Lycee Technique d'Etat, Thiers go on to take one of the BTS options.

7. Redoublement - this is the process whereby a child repeats an unsatisfactory year.

8. Parents - parents (and pupils) are formally represented at the termly class meetings which form the basis of observation/orientation. Parents in France are organised in two major unions and are a very powerful influence in education.

## KEY TO FIGURE 1

This is a very simplistic model of the course of French education following exit from the primary level. It is biased towards technical/vocational education, therefore no attempt is made to explore the intricacies of the Lycee Generale programmes which, needless to say, are very important.

The varying widths of arrows are an attempt to redress the visual imbalance of the diagram (less than 10% of children find their way to an LEP via Classes CPPN, the vast majority arrive at the end of the Cycle of Observation (5me)). French educationalists (fiercely proud of their tradition of equal opportunities) would be mortified to see lacking in this diagram all the interconnections which ensure a child's way back into the more prestigious areas of the system - however, this is a paper not an encyclopaedia and it will be sufficient to bear in mind that, although the bulk of movement from one institution to another in French education tends to be downward rather than upward there is a significant proportion of upward movement.

Note -All circled terms are qualifications.

CES - College d'Enseignement Secondaire - (Secondary School)

SES - Section d'Education Specialisee - (MLD Unit)

CPPN - Classe Pre-Professionnelle de Niveau - (Lower ability, not necessarily MLD)

LEP - Lycee d'Enseignement Profesionelle - (Secondary modern -cum- sixth form college)



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CFA - Centre de Formation d'apprentis - (Apprentice training centre)

CPA - Cours Préparatoire d'Apprentissage - (Preparatory year, apprenticeship)

Contract - CFA teach hand in hand with an employer with whom the pupil makes a contract.

prof. Professionel = vocational

BTS - Brevet de Technicien Supérieur - (Very high grade technical qualification - students often go on to the Grandes Ecoles - somewhat superior Universities).

BAC Gen - Classical Baccalaureat

BAC Tech - Technical Baccalaureat

BAC Prof - Vocational Baccalaureat

BEP - Brevet d'Enseignement Professionel - (General professional qualification)

CAP - Certificat d'Apptitude Professionel - (Specific vocational qualification)

## 4. Conclusions

Thus we have two similar curricula delivered in radically different ways. Other important differences include the following considerations - French teachers have no responsibility for supervision outside lesson time and are not considered to be 'in loco parentis'. French State Schools do not teach religious studies or any form of PSE. Teachers in France benefit from a day and a half off per week 'preparation time'.

The two systems are, in many ways, diametrically opposed - English/Welsh education is in a convergent mode - ie we are becoming bound by law to teach specified material whereas French education is divergent, previously rigid state control is being relaxed.

English/Welsh education is 'idealistic' - it aspires to 'educate' rather than 'train' children: where vocational technological education as the French know it takes place in secondary education in England and Wales, it may be argued that it takes place via TVEI and CPVE. However, the specific vocational elements of such courses vary so widely between institutions it is difficult to quantify. In fact nearly all testable vocational technology take place after secondary education via government agencies, day release programmes etc.

French Education is overtly vocational - it is largely paid for by taxes on industry and is expected to produce the full range of workforce from managers and research & development staff through to skilled and semi-skilled factory floor workers

Finally, and perhaps most significantly, French secondary education is EXPENSIVE - there are more role specific institutions, more administration, smaller classes and children remain in full time education much longer. By comparison English/Welsh secondary education is ludicrously cheap and with the advent of the National Curriculum teachers are expected to actually produce more results/resources/assessment in, effectively, less time and with less money.

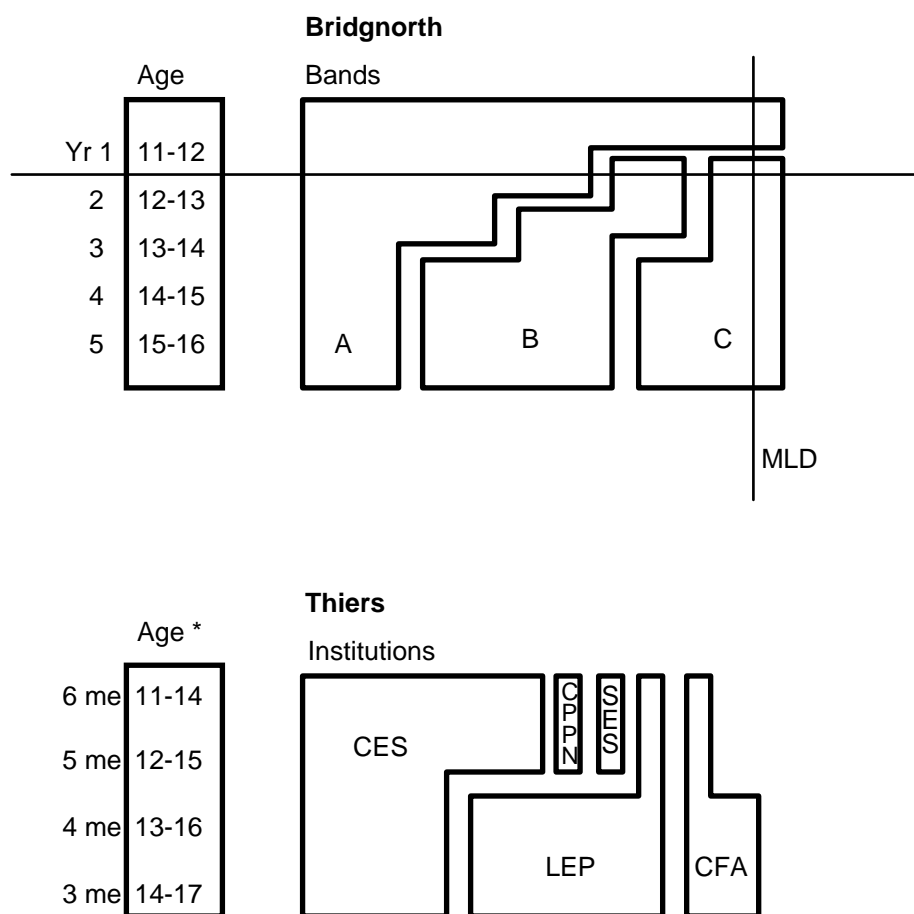
Thus, superficially at least, it is perfectly clear why French children are more technologically literate than ours on leaving school - they have been educated with clear, marketable objectives in mind, they've been learning longer and they've had more money spent on them. But that's not all of it - we need to look at who is more technologically literate, after all, it's undoubtedly fair to say that the best of

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our Design and Technology students could bear comparison with any in the world, let alone Europe! Inevitably it's the middle/lower ability children who are specifically and effectively targeted in France in terms of strategy, institutions and terminal qualifications. One would love to be able to compare the level of personal satisfaction and sense of achievement (not to mention job prospects) of the English pupil with a GCSE grade G in Design and Technology with that of the French pupil with a Certificat d'Aptitude Professionel in machining!

**Figure 2**

**Secondary Education: Grouping and Movement in Bridgnorth and Thiers**



\* Age range in Thiers (exceptionally) may be greater than shown

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