White Paper

on

Improving your school's Timetable

An effective timetable is an essential feature of a good school. It controls (and supports, or inhibits) the school's activities, period by period for the school year.
A school which does not take great care to get a quality timetable, with a good rhythm to support the pedagogy, will be forever struggling uphill.

New Heads and Deputy Heads are often quick to see the flaws in the school's curricular structure or in its timetable. And perhaps the flaws become clearer as time goes by.
But what's to be done about them? How to make changes successfully?
How to keep all your colleagues informed, involved, and persuaded?

Will the change be to the timetable cycle?
And to the curriculum time allocated to the subjects as well?
Or just to the curricular structure? More blocks or fewer? More setting or less?

This white paper discusses these questions. It is intended to inform and guide you on some of the key decisions you will need to make.

Contents

Changing the time-frame : what are the factors involved ?

- New Heads often bring change
- Change needs advance planning
- What are (valid) reasons for changes in the timetable structure?

The Law of Novelty : *Quite often, about one year after the appointment of a new Head, there is a major change in the school's curricular structure.*

Quite often this involves a change of the time-frame (ie. changing the number of lessons in the week/fortnight or the length of lessons).
For example, this may be necessary in order to align schools that are joining together in a consortium (eg. for the delivery of a range of 14-19 diplomas). Or there may be other reasons (see below).

However, changing the timetable cycle is not something to be undertaken lightly or in a hurry! It is always best to plan for the September after next! Everyone needs to be consulted. Parents in particular may react angrily to your plans if the start/end times of schooling are affected.

If the start-time or end-time is to be changed then the local bus/taxi companies will need to be consulted as well as parents. The local transport authority may not be able to cope if several schools are synchronised.
If lunch time is to be moved then the caterers and lunch-time supervisors will need to be involved. Some extra-curricular activities may happen at lunch time and the new arrangements will possibly affect them.

In considering changes to the timetable cycle (see items 1 - 5 below, and page 4) you should also take into account the adverse effect of long lessons on some subjects, see page 5.
Fewer periods per cycle (longer lessons) may reduce corridor traffic but they usually have an detrimental effect on pedagogy and may adversely affect your exam results.

Other reasons for changing the timetable cycle

Most often the change has been from a 1-week cycle to a 2-week cycle. Sometimes the reverse.

If the number of periods in the 2-week cycle is exactly double that of the one-week cycle, then:
Scenario A is that the pattern of lessons in Week-1 is very different from Week-2,
Scenario B is that Week-1 and Week-2 are almost identical,

Scenario C is that the number of periods in the 2-week cycle is more or less than double the one-week cycle.

1. Pedagogical reason:
Scenario A might be used to reduce the "Friday afternoon is bad" effect.
Instead of the same class having an uninspiring teacher on Friday afternoon every week, it is reduced to once a fortnight ...thus possibly improving learning, and behaviour?
(Monitoring absences for each class by odd/even Friday afternoons might show a pattern.)
Also, to reduce the effect of public holidays if they tend to be the same day (eg. Mondays in the UK).

continued...

2. Managerial reason:
Same as 1, but intended to reduce staff grumbling about the same difficult class every Friday. It may improve staff morale. It may reduce staff absence.

3. Curricular reason:
Scenario B (and scenario A) allow some time-slots to alternate (eg. Monday-period-3 is ICT in week-1, but Spanish in week-2).
So it may be expanding the curricular experiences of the students, giving two subjects instead of one.

4. Managerial reason:
As in (3) scenario B (and A) allows some time-slots to alternate (eg. ICT in week-1, Spanish in week-2). In effect this is giving a half-period of ICT to the class (by giving them one period per fortnight).

Another example: 2 hours per week is too much for History (say) in KS3 and 1 hour per week is not enough, so we go for 3 (hour) lessons per fortnight.
So this method is sometimes used when the 'robber-barons' of the Heads of Department can't agree to give up any periods for a new or expanding subject, and the Head avoids a confrontation by this device (typically going from a 25-period-week to a 50-period-fortnight).

5. Managerial & curricular reasons:
Scenario C is an extension of reason 4. If (for example) a 25-period week is changed to a 60-period fortnight, then the main reason for the change to a 2-week cycle may be to disguise that fact that the amount of curriculum-time for a subject often cannot remain the same.

For example, if Maths had 4 periods in a 25-period week (16%) then if it has double the number (8 periods) in a 2-week 60-period cycle its curriculum-time has been reduced (to 13.3%) ...or if it has 9 periods it has 15% ...etc.
See also the next page.

The result is that no-one can have the same as before (so no department is being obviously singled out) and the Head can then adjust the balance of time in the direction s/he wants, and/or which is more appropriate to the students' needs (if the staffing and their specialisms allow a change of direction like this). Machiavellian? Or pragmatic?

(As a further refinement, a school already with a 50-period fortnight may change to a 60-period fortnight for the same reason.)

Although it may be tempting to make a change in the time-frame, for any of the reasons above, the ultimate test is : 'Will it actually help the students?'

Alternative structures

See sections 7.8 and 11.18 in *'The Timetabler's CookBook'* for more about alternative structures.

Section 7.8 discusses a 'non-rectangular' week, with staggered starts and/or finishes, to allow greater utilisation of your resources (staffing and accommodation).

Section 11.8 discusses staggered lunch-breaks, and 'modular' or 'grid' timetables.

Changing the timetable cycle : Sharing out the time

- Heads of Subjects (the 'robber-barons' of the curriculum) need careful handling when their time allocations are changed, particularly if the time is reduced. Professional discussions about the impact are needed and perhaps even counselling.
- As Head, if an Art teacher leaves, don't just assume that you need to appoint a new Art teacher; else your school can never change curricular direction. Instead, analyse the school's Staff Loading Chart for next year (see Section 6.4 in *'The Timetabler's CookBook'*).

Sharing out the time:

('ppw' = periods per week, 'ppf' = periods per fortnight)

40 ppw	1 lesson = 2.5%	60 ppf	1 lesson = 1.7%
35 ppw	1 lesson = 2.9%	50 ppf	1 lesson = 2%
30 ppw	1 lesson = 3.3%		
25 ppw	1 lesson = 4%		

100 modules pw (eg. on a 15-minute grid)	1 module = 1%
75 modules pw (eg. on a 20-minute grid)	1 module = 1.3%

The effect of any changes:
Of course when you change the timeframe, individual subjects gain or lose time in each year and may gain or lose time overall.
Some subjects are taught to small groups, others are taught to large, ...so any changes can affect your staffing levels.

Taking a Year focus: If small-group subjects increase their time, average teaching group size goes down in that year, the number of staff used will go up. Check what the Staff Deployment Analysis looks like!

Looking at the Whole School: If small-group subjects gain time overall, then the overall average group size goes down, and so the Contact Ratio goes up or more staff are needed. Check the budget!

Length of lessons
You will need to consult with your colleagues, but typical reactions from different subject areas are:

35 mins	MFL (languages) prefer 1 period, Maths may like 2, Science and Technology like 2, 3 or 4 periods.
40 mins	MFL like 1 period, Maths like 1 or 2, Science/Tech like 2, 3 or 4.
50 mins	MFL cope with 1 period, Maths like 1, Science/Tech like 2 or 3.
60 mins	MFL want 0.5, Maths like 1, Science/Technology want 1 or 2 (depending on the age of the students).
15 mins	MFL like 2 units, Maths like 3, Science/Technology like 5 units.

Research on the effects of timetabling

Recent research by Professor Russell Foster of Oxford University has confirmed the importance of circadian rhythms on students' learning, particularly students in Key Stages 4 and 5.
This research has been applied at Monkseaton High School, and New Scientist magazine reported *"Absenteeism is down, punctuality is up and exam results have gone through the roof"*.
See:

- New Scientist, 8 October 2011, pages 42-44,
- BBC : http://news.bbc.co.uk/1/hi/england/tyne/7932108.stm including an audio download of an interview with Prof Foster.
- http://www.huffingtonpost.co.uk/paul-kelley/afternoon-school-starts_b_8510496.html

Maybe you should be discussing these topics with your Senior Management Team?

There are 3 main aspects:

- **Starting the School Day later** (eg. 10am) for KS 4 and 5 appears to have distinct benefits.
  http://www.ndcn.ox.ac.uk/research/sleep-circadian-neuroscience-institute/research-projects-4/teensleep
  http://www.tandfonline.com/doi/full/10.1080/17439884.2014.942666

  Note to the timetabler :
  If you want to set up different Day Structures for KS 4/5 from the rest of the school, then in ***TimeTabler*** you can use the Shape Screen [see HelpMovie 11] or the Class Availability Screen [see HelpMovie 20]. eg. block off the first period, with an extra period at the end of the day, see Section 7.8 in *'The Timetabler's CookBook'*.

  You may want to do 'What if...?' investigations -- see the PDF in the KnowledgeBase.

  You will need to think through all the ramifications of such a change, see for example pages 34-36 in *'The Timetabler's CookBook'*.

- On your timetable for KS4/5, **lessons that you schedule between 9am-11am** are ***less*** effective and may even be damaging the students' mental health!
  The research has exploded the myth [for KS4/5] that "academic lessons are better in the morning". It appears that KS4/5 students learn better late morning or early afternoon (though we don't know which subjects are most affected). You may wish to take this into account when scheduling 'academic' upper school lessons.

- Dr Paul Kelley, ex-Head of Monkseaton High School and author of 'Making Minds', has also investigated 'Spaced Learning', ie. **short lessons with contrasting intermissions**, see :
  https://en.wikipedia.org/wiki/Spaced_learning
  http://www.tes.co.uk/article.aspx?storycode=6007908

  Keith Johnson has advocated this method for many years for revision, see *'GCSE Physics for You'* pp 382-3; *'Advanced Physics for You'* p 387; and the PowerPoint at :
  http://www.timetabler.com/physics4u/powerpoints/Revision%20Technique.ppt A good topic for a staff meeting?

  Some schools have tended towards timetables with fewer, longer periods [perhaps for staff convenience or corridor traffic] but this is probably a mistake in terms of the effectiveness of learning, particularly for some subjects, unless the teacher can be certain of building in effective intermissions.

Keeping everyone on-side : informing colleagues

- It is essential that everyone understands what changes are proposed, and their part in it.
- The only unambiguous way to discuss proposed changes in curricular structure is to publish a Curriculum Diagram.
- Whether or not you change the time-frame (pages 2-4), there are other changes to the structure that can be considered, perhaps by setting up a Curriculum Working Party.

A key point when making any change in the school is to keep all staff, including non-teaching staff, 'on-side' and 'reading from the same hymn sheet'. There are many aspects to this (beyond the scope of this white paper), including, not least, the tone that you set in staff meetings.

And when it comes to discussing the existing or a proposed curricular structure, and how to make it best satisfy the needs of your students and your colleagues, the only effective and unambiguous way is to show it on a 'Curriculum Diagram', like this:

9A	En	Ma	Sc	Fr	Hi	Gg	Ar	Mu	Re	Se	Te	Pe	
9B	En	Ma	Sc	Fr	Hi	Gg	Ar	Mu	Re	Se	Te	Pe	
9C	En	Ma	Sc	Fr	Hi	Gg	Ar	Mu	Re	Se	Te	Pe	
9D	En	Ma	Sc	Fr	Hi	Gg	Ar	Mu	Re	Se	Te	Pe	
periods:	4	4	4	4	2	2	2	1	1	2	2	2	=30
	SSSS	SSSS	DSS	SSSS	SS	SS	D	S	S	SS	D	D	

A Curriculum Diagram shows Subject teaching-groups, and how they are sometimes combined into Blocks [for setting, for options, for 'consistent setting', for a carousel/circus/rota, etc].

Chapter 2 in *'The Timetabler's CookBook'* shows 25 Curriculum Diagrams like this.
You can download part of Chapter 2 at www.timetabler.com/book.html or order the full book.
These Curriculum Diagrams can give you ideas for changes in your school.

A Curriculum Diagram is usually drawn in a spreadsheet like the ones shown at:
www.timetabler.com/SupportCentre/CurriculumDiagram.xls

If you have the ***TimeTabler*** software then the diagram is drawn for you.

Reviewing the current curriculum and proposing changes

If you decide to make a Review of the current curricular structure, you'll need

- A Curriculum Diagram of your existing structure, and
- A calculation of the current 'curriculum bonuses' using Staff Deployment Analysis, as explained in Chapter 5 of *'The Timetabler's Cookbook'*.

And you'll need to decide whether the Review should be undertaken by:
(i) yourself, (ii) the Senior Leadership/Management Group, (iii) a Curriculum Working Party consisting of Heads of Subjects and any interested colleagues, or (iv) all of these.

Discussions at the first stage should focus on the Structure ('pure class' lessons; blocks; 'setting' by attainment/ability; 'consistent setting'; option blocks, etc).
See the many varieties of curricular structure in Chapters 2 and 3 of *'The Cookbook'*.

Curriculum Working Parties should be required to report back by the end of Term 1 ...to give the timetabler time to look at any proposed changes, and to check their viability, by:

- re-calculating the curriculum bonuses, eg. by getting ***TimeTabler*** to do it for you,
- doing 'What if...?' experiments, eg. by using ***TimeTabler*** (see page 7).

Managing Change :
Practical ways forward for the Timetabler

If a new curricular structure is put forward, what can the Timetabler do to test if it is feasible?

1. If you are sharing your curricular ideas with colleagues in your school or in other (linked) schools, the only non-ambiguous way is to use a **Curriculum Diagram** as described on the previous page. If you have ***TimeTabler*** then the diagram is drawn for you.

2. A **Schematic Diagram** can help to clarify impossibilities in the structure and the staffing of that structure. See Chapter 4 in *'The Timetabler's CookBook'.*
   It is often not necessary to draw a schematic diagram of the whole year. *For example,* if you are investigating whether you have enough Music teachers to schedule the section involving Music, then you may only need to draw the schematic diagram for that part of the curriculum.

3. A **Combing Chart** (see Chapter 7 in *'The Timetabler's CookBook'*) is a useful pre-scheduling test which can indicate if a schedule will be impossible to schedule, and it may help you to identify the exact reason for scheduling impossibilities.
   It is best done for each department (or faculty) initially, and then extended to pairs of departments which have a member of staff in common, or are otherwise linked (for example by the option blocks in years 10–11). ***TimeTabler*** will do this for you.
   The CD enclosed with *'The Timetabler's CookBook'* includes an INSET/CPD Training Pack that can be used to good effect in a Heads of Subject Meeting, see page 98 in the book.

4. A **Conflict Matrix** (see Chapter 8 in *'The Timetabler's CookBook'*) is another pre-scheduling test which can help you to identify clashes which may make a schedule impossible.

5. One of the tensions caused by new curricular structures is the interaction between teachers 'in parallel' in Upper school (ie. a teacher-team all teaching at the same time) and teachers 'in series' in Lower school (ie. a team of teachers teaching the same population at different times). See Section 2.18 for more about how this may be affecting your school.
   This interaction can be examined and improved by using **Zarraga's Rule** (see Chapter 10 in *'The Timetabler's CookBook'*), but the results are not always easy to interpret.

6. **'What if…?' investigations**
   With modern timetabler software it is easy to do 'What if…?' trial runs, to see how difficult any new curricular proposals may be.
   If you have Keith Johnson's ***TimeTabler*** software then get the full details of how to do some 'What if…?' investigations by clicking on:
   www.timetabler.com/SupportCentre/What-if-investigations.pdf
   The unique 'Batch' system of ***TimeTabler*** makes it easier for you to do 'What if...?' tests.

   For 10 Key Reasons why ***TimeTabler*** is good for your school and for you, please click on:
   www.timetabler.com/PDFs/10-Key-Reasons.pdf

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