

Another Model for a joint S4/5/6

Lesmahagow High School is a school of about 500 pupils in South Lanarkshire. The staff operate a joint S456 and have a 32-period week plus Tutor Time.

S4 pupils study 7 subjects (4 periods each), plus 4 core periods.

S56 pupils can study 5, 6 or 7 subjects: some National Courses (4 periods) along with some Higher courses (6 periods). There are 2 core periods in S56.

Options software

The school wanted to use the **Options** software [www.timetabler.com/options] and allow pupils to have a free choice of courses.

The difficulty was how to set up the **Options** software where S4 pupils had 7 choices and S56 could have 5, 6 or 7 choices.

Although the school runs a joint S456, it was decided at an early stage to use the **Options** software twice. Once for S4 and then a separate pattern for S56. This paper explains how.

First a column structure for only S4 pupils was created and after this structure had been finalised it was used as a 'seed' to create a column pattern for the S56 year groups.

The alternative of creating one pattern for all S456 was considered but the school wished to put the emphasis on S4 pupil choice and this was felt to be the best way to proceed.

These column structures were combined when creating the Activity Batches to produce the timetable with the **TimeTabler** software.

S4 Options

The **Options** software ran in the usual way – 7 blocks named A – G (4 periods) and a Pattern created.

S56 Options

To try and accommodate all abilities, the school offers 6 period Higher and Advanced Higher courses as well as 4 period National 4/5 courses.

What is unusual, is that the curriculum structure allows pupils to study 5, 6 or 7 subjects in S56. There may be some 2 period Short Courses for some pupils depending on their mix of Highers and Nationals.

So, for example, one pupil could do 5 Highers while another did 3 Highers and 3 Nat.5s while another could study 7 Nat.5s. Obviously there are many other permutations.

To accommodate all these variations, the **Options** software (at the second stage) was set up for S56 with 7 blocks and for some pupils they were given 1 or 2 'dummy' subjects (Blank 1 and Blank 2) or some short courses (SC - 2 periods).

Curriculum Structure

As S56 pupils can study 5, 6 or 7 subjects the curriculum structure is set up as follows:

Blocks A, B and C (12 periods)

Blocks D, E and F (12 periods)

Block G (4 or 6 periods)

The diagrams in Appendix 1 show this a bit more clearly.

Using the Options software to create a Pattern for S456

S4 Options

The pupils made 7 choices (including English + Maths) in order of preference along with 2 Reserves. The finalised S4 diagram below shows the Pattern that was created in **Options**:

Block A	Block B	Block C	Block D	Block E	Block F	Block G
Eng 5 42	Geo 5 18	Eng 5 47	Bio 5 19	Bio 5 16	Bio 5 14	Bio 5 15
Eng 4 5	His 5 20	Eng 4 0	Geo 5 19	Phy 5 15 -1	Che 5 11	Che 5 18
Mat 5 47	Mus 5 21	Mat 5 42	MSt 5 19 -1	PE 5 18	His 5 17	Geo 5 17
Mat 4 0	Bus 5 11 -1	Mat 4 5	Wood 5 20	Dra 5 12	RMPS 5 4 -1	D+M 5 12
	Ger 5 3 -1		Cmp 5 16	Art 5 14	Gcom 5 12	Hos 5 12
	PE 5 21			Adm 5 17	Fre 5 6	Dra 5 20
					Colleg 14 -1	
					Hos 5 13	
= 94	= 94	= 94	= 93	= 92	= 91	= 94

You can also see that the school had the ability to run S456 Maths/English sets in 2 columns (A and C). (A bigger school, Queen Anne High School in Dunfermline, runs a very similar structure, but keeps S4 Maths and English separate from S56 sections. See Appendix 2.)

S56 Options

The column structure above was then used in creating a 'seed' for the S56 Pattern (see the next page). Eg. in Block B - all subjects apart from Mus 5 were put into the seed for the S56. Nobody had chosen Music 5 in S56.

S56 pupils were counselled to make 7 free choices but, in some instances, there may have been some Blanks or Short Courses depending on the mix of Highers/Nationals. Page 6 shows the many possible permutations for S56 pupils.

Example 1

For a 5 Higher Pupil – the following options. Blank 1 and Blank 2 were the 'dummy' subjects.

Choices:

1 Blank1 2 Blank2 3 RMPS H 4 Mus H 5 Eng H 6 His H 7 Bio H Reserve: Gcom H

Click to select:

+ Adm	+ Art	+ Bio	+ Blan	+ Bus	+ Che	+ Cmp	Coll	+ DM	+ Dra	+ Eng	FouA
+ Fre	Free	+ Gcom	+ Geo	+ Ger	+ His	+ Hos	Lab	+ MSt	+ Mat	+ MatA	+ Mus
MSt	PE	Phy	RMPS	SC	Scot	Stud	Tr&T	W&A	Wood		

Example 2

This pupil had a mix of Highers and N5s so only one Blank subject – 6 subjects in total.

Choices:

1 Blank1 2 Ger H 3 Cmp 5 4 Eng H 5 His 5 6 Geo 5 7 Mat 5 Reserve: MSt 5

Example 3

This 3rd pupil had only 1 Higher, the rest were N5s and 1 Short Course (2 periods)

Choices:

1 SC 1 2 Mus H 3 Adm 5 4 Bus 5 5 Eng 5 6 Tr&T 5 7 Colleg Reserve: {none}

S56 Pattern

The S4 pattern was used as a 'seed' when creating a pattern for S56 pupils. Blanks and Short Courses were also put into the seed and the following S56 pattern created in **Options**:

Block A	Block B	Block C	Block D	Block E	Block F	Block G
Art AH 4	Bus 5 6	Cmp AH 4	Cmp 5 4	Adm 5 5 -3	Bus H 20	Adm H 20 -2
Phy H 14	Ger 5 6	D+M H 5	Wood 5 7	Art 5 2	Gcom H 17 -4	Cmp H 9
Mat 5 20 -2	PE 5 1	Bio H 18	MusT 8	Dra 5 4	GcomAH 7	D+M 5 4
Mat AH 5 -1	Geo 5 8	Che AH 3	Bio 5 1	Bio 5 2	Mus H 16	Art H 6
Eng 5 11	His 5 2	Mat 5 22 -2	Mat H 16 -1	PE 5 3	Bio 5 3	Dra 5 0
Eng AH 4	Blank1 111	Mat H 17 -1	Eng H 22	Blank1 13	Che 5 3	Dra H 5
Eng H 25	Blank2 1 -6	Eng 5 11	Fre H 6 -1	Blank2 98 -6	Che H 8 -1	Bio 5 5
Geo AH 5	SC 1 9	His AH 6 -1	PE AH 10	SC 1 5	Phy AH 2	Bio AH 4 -1
RMPS 5 1	SC 2 0	His H 30	Geo 5 7	SC 2 6	Eng H 24	Bio H 11
RMPS H 16 -1		FouA 6 6 -2	Geo H 21 -1	WAch3 1	Fre 5 4 -1	Che 5 2
WAch2 1		WAch1 5	MSt 5 6 -4	WAch4 1	Hos 5 3 -1	Hos 5 4 -1
WAch3 1		WAch4 3	MSt AH 1	WAch6 2	His 5 3	PE H 24 -4
WAch4 6		WAch5 6 -1	Tr+T 5 16 -1		RMPS 5 1	Geo 5 3
WAch5 12 -1		WAch6 1	WAch3 3		RMPSAH 4	MSt H 25 -4

This pattern hopefully shows all the Higher and Advanced Higher sections in Columns A, C, D, F and G, as well as the many instances that S56 pupils can fit into S4 N5 classes.

Difficulties

Some of these blocks 'overlap' – for want of a better word.

Eg. The school only has one RMPS teacher. You can see that the teacher is required to teach 6 periods in Block A – a joint H/N5 section. Perhaps it is easier to think of it as Block A (4 periods) + Block B (2 periods).

In an earlier (trial) pattern there was a RMPS N5 class in Block B as well. This would have been impossible as the teacher was needed for two of these Block B periods to teach the class in Block A.

Once both S56 and S4 structures are finalised the appropriate Activity batches can be created in **TimeTabler**.

The notation of Column **A** (4 periods) and Column **a** (2 periods) etc was used to get round the fact that there were 6 period courses and 4 period courses.

Once the pattern is finalised the timetabling part is fine – the Curriculum diagram is shown on the next page.

The Curriculum Diagram for S56 is shown below.

Some of the Blocks have been re-named, but essentially they are the same as the Blocks from **Options**.

Blocks a and c below are the courses that are in Block B in **Options** + 2 H/AH periods from Blocks A and Block C.

Blocks d and f are the courses that are in Block E in **Options** + 2 H/AH periods from Blocks D and Block F.

Block A – is the same as the **Options** Block A (4 periods).

Block a – is the 2 periods of Block A H/AH courses + 2 periods of Block B (**Options** courses) + any Short Courses (2 periods).

Block c – is the 2 periods of Block C H/AH courses + 2 periods of Block B (**Options** courses) + any Short Courses (2 periods).

Block C – is the same as the **Options** Block C (4 periods).

This same set up is repeated for Blocks D, E (lowercase d and f) and F.

Block G + g – is a ‘stand alone’ block. Pupils in S56 will either study a 6 period H/AH course or a 4 period N45 course + a 2 period short course.

Block H + I are the 2 Core Periods PSE + PE/RE.

S56 [32]	A	a	C	c	D	d	F	f	G	g	H	I
	Art1 =Ar Eng1 JMa Eng1 KFa Eng2 LQu Eng3 LPa Geo1 SMu Mat1 KPr Mat1 DBu Mat2 MMe Mat3 =Ma Phy1 GMi RMP1 GSm SpD1 =PE+ =pe WWO1 HLa YAA1 V2 4 SSSS	Art1 =Ar Eng1 JMa Eng1 KFa Geo1 SMu Mat1 KPr Phy1 GMi RMP1 GSm Geo1 SLe His1 =Hi Mus1 =Mu Bus1 DBr Ger1 ETU PE 1 =PE+ =pe SCa1 V3 2 SS	Bio1 IIq Cmp1 LFo Che1 EBr Des1 GWi+ =gr Eng1 KFa Eng2 LQu Eng3 LWr His1 FRo His1 MSm Mat1 KPr Mat1 DBu Mat2 MMe Mat2 JIn Fou1 V1 WWO1 HLa 4 SSSS	Bio1 IIq Cmp1 LFo Che1 EBr Des1 GWi+ =gr His1 FRo His1 MSm Fou1 V1 Geo1 SLe His1 ARA Mus1 =Mu Bus1 DBr Ger1 ETU PE 1 =PE+ =pe SCc1 V3 2 SS	Bio1 IIq Cmp1 LFo Eng1 LPa Fre1 ETU Geo1 SLe Mat1 DBu Mus1 LCI PE 1 NRo+ =pe Adm1 JWi Art1 =Ar Bio1 VGr Dra1 HGa PE 1 =PE+ =pe Phy1 GMi SCd1 V1 2 SS	Eng1 LPa Fre1 ETU Geo1 SLe Mat1 DBu Mus1 LCI PE 1 NRo+ =pe Adm1 JWi Art1 =Ar Bio1 VGr Dra1 HGa PE 1 =PE+ =pe Phy1 GMi SCd1 V1 2 SS	Bio1 IIq Bus1 =Ad Che1 EBr Eng1 LQu GCoi GWi+ =gr GCoi Fme+ =gr Mus1 KBl Phy1 V2 RMP1 GSm Adm1 JWi Art1 =Ar His1 MSm Hos1 EDU+ =he Mus1 KBl Phy1 GMi RMP1 GSm Col1 KFa WWO1 HLa 4 SSSS	Bus1 =Ad Che1 EBr Eng1 LQu GCoi GWi+ =gr GCoi Fme+ =gr Mus1 KBl Phy1 V2 RMP1 GSm Adm1 JWi Art1 =Ar His1 MSm Hos1 EDU+ =he Mus1 KBl Phy1 GMi SCf V1 2 SS	Adm1 JWi Art1 GSh Bio1 VGr Bio1 IIq Bio1 EBr Cmp1 LFo Dra1 LCI Mod1 AFi PE 1 BWi+ =pe SCg1 V1 2 SS	Adm1 JWi Art1 GSh Bio1 VGr Bio1 IIq Cmp1 LFo Dra1 LCI Mod1 AFi PE 1 BWi+ =pe SCg1 V1 2 SS	PSE1 JMa PSE2 V1 PSE3 LWr PSE4 FRo PE.5 =PE+ =pe PE.6 =PE+ =pe RME7 GSm 1 S	PSE5 JMa PSE6 FRo PE.1 =PE+ =pe PE.2 =PE+ =pe RME3 GSm 1 S

This was then timetabled in **TimeTabler**, where the Class Timetable Screen showed:

Views	Monday							Tuesday							Wed							Thurs							Friday				Tot Pds
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	
S5X (S56)	A	F	d	q	H	I	D	F	F	A	a	C	C	f	d	D	c	A	G	G	a	G	G	F	f	C	C	A	c	D	D	32	
S4X (S4)	M3a	VGr	LQu	V2	V3	JMa	JMa	VGr	VGr	V1	V1	VGr	VGr	V5	LQu	IIq	VGr	V1	JWi	JWi	RRi	JWi	JWi	VGr	V5	VGr	VGr	V1	VGr	IIa	IIa	32	
	Art1	Bio1	Eng1	Adm1	Adm1	PSE1	PSE5	Bio1	Bio1	Art1	Art1	Bio1	Bio1	Bus1	Eng1	Bio1	Bio1	Art1	Adm1	Adm1	Art1	Adm1	Adm1	Bio1	Bus1	Bio1	Bio1	Art1	VGr	IIa	IIa		
	V3	V3	ETU					V5	V5	JMa	JMa	V2	V3	EBr	ETU	LFO	V3	V2	JMa	GSh	GSh	V1	GSh	GSh	V1	EBr	V2	LFO	V3	LFO	LFO		
	Eng1	Bus1	Fre1	NRo	NRo	LQu	HP	Cmp1	Bus1	Bus1	Eng1	Eng1	Cmp1	Cmp1	Che1	Fre1	Cmp1	Cmp1	Eng1	Art1	Art1	Eng1	Art1	Art1	Bus1	Che1	Cmp1	Cmp1	Eng1	Cmp1	Cmp1		
	KFa	EBr	SLe	PE.1	PE.1	PSE1	RME1	KDe	EBr	EBr	KFa	KFa	IIa	IIa	LPa	SLe	LQu	V4	V4	KFa	V4	VGr	KFa	V2	V5	LPa	V3	IIa	V4	LQu	LQu		

In the timetable above:

S5X + S4X are the combined S456 sections.

The 2 periods of column a and the 2 periods of column c are the Block B courses in **Options** + also the 2 H/AH periods of Block A and Block C + Short Courses in column a and short courses in column c.

The 2 periods of column d and the 2 periods of column f are the Block E courses in **Options** + also the 2H/AH periods of Block D and Block F + Short Courses in column d and short courses in column f.

The 2 periods of column g are the 2 H/AH periods of Block G + Short Courses in column g.

In this example the school wanted to timetable S4 and S56 core subjects on a Monday as many pupils go to college on that day.

Appendix 1

Example 4 : A pupil choosing 5 Highers:

12 Periods		
Block A	Block B	Block C
Higher. (6 per)	Blank	Higher. (6 per)

12 Periods		
Block D	Block E	Block F
Higher. (6 per)	Blank	Higher. (6 per)

6 periods
Block G
Higher. (6 per)

Example 5 : A pupil choosing 7 N5s

12 Periods		
Block A	Block B	Block C
Nat 5(4 per)	Nat 5(4 per)	Nat 5(4 per)

12 Periods		
Block D	Block E	Block F
Nat 5(4 per)	Nat 5(4 per)	Nat 5(4 per)

4 periods
Block G
Nat 5(4 per)

Example 6 : A mix of H and N5s : version 1

12 Periods		
Block A	Block B	Block C
Higher. (6 per)	Short Course (2 per)	Nat 5(4 per)

12 Periods		
Block D	Block E	Block F
Nat 5(4 per)	Short Course (2 per)	Higher. (6 per)

6 periods
Block G
Higher. (6 per)

Example 7 : A mix of H and N5s : version 2

12 Periods		
Block A	Block B	Block C
Higher. (6 per)	Blank	Higher. (6 per)

12 Periods		
Block D	Block E	Block F
Nat 5(4 per)	Nat 5(4 per)	Nat 5(4 per)

4 periods
Block G
Nat 5(4 per)

All Highers and Advanced Highers MUST be in Blocks A, C, D, F and G.

All Blanks and Short Courses MUST be in Blocks B and E. Blank 1 and 2 along with the Short Courses are put into the 'seed' in **Options** to make sure they were in the correct Blocks.

It would be impossible to study a N5 course in Block B if the student was doing a Higher in Blocks A or C. Hence the need for a 2-period Short Course.

It would be impossible to study a N5 course in Block E if the student was doing a Higher in Blocks D or F. Hence the need for a 2-period Short Course

The school was able to run S4 core and S56 core at the same time.

	A	B	C	D	E	F	G	H
	A (4)	a (2) c (2)	C (4)	D (4)	d (2) f (2)	F (4)	G (4)	g (2) H (2)
S56	AH	AH AH	AH	AH	AH AH	AH	AH	AH S56 Core
	+	+ +	+	+	+ +	+	+	+ +
	H	H H	H	H	H H	H	H	H +
+	+	+ +	+	+	+ +	+	+	+ SC
	N45	S56 - N45	N45	N45	S56 - N45	N45	N45	S4 Core
S4		S4 - N45			S4 - N45			S4 Core

When trying to obtain a column structure for S5/6 we need to give ALL pupils 7 options as described below.

	B - Blank		SC - Short Course						
S5	1	2	3	4	5	6	7	R	
5 Highers	H	H	H	H	H	B1	B2	R	
4 Highers	H	H	H	H	N5	B1	B2	R	
OR	H	H	H	H	N5	B1	SC1	R	
3 Highers	H	H	H	N5	N5	N5	B1	R	
OR	H	H	H	N5	N5	B1	SC1	R	
OR	H	H	H	N5	N5	SC1	SC2	R	
2 Highers	H	H	N5	N5	N5	N5	B1	R	
OR	H	H	N5	N5	N5	SC1	SC2	R	
1 Higher	H	N5	N5	N5	N5	N5	SC1	R	
OR	H	N5	N5	N5	N5	N5	N5	R	
0 Higher	N5	N5	N5	N5	N5	N5	N5	R	

Columns- Permutations (There are others)									
A(6)	C(6)		D(6)		F(6)		G(6)		
A(4)	a(2)	c(2)	C(4)	D(4)	d(2)	f(2)	F(4)	G(4)	g(2)
H	B1		H	H	B2		H	H	
H	B1		H	H	B2		H	N5	SC1
H	B1		H	H		SC1	N5	H	
H	B1		H	N5	N5		N5	H	
H	B1		H	H		SC1	N5	N5	SC2
H		SC1	N5	H		SC2	N5	H	
H	B1		H	N5	N5		N5	N5	SC1
H		SC1	N5	H		SC2	N5	N5	SC3
H		SC1	N5	N5	N5		N5	H	
H		SC1	N5	N5	N5		N5	N5	SC2
N5	N5		N5	N5	N5		N5	H	
N5	N5		N5	N5	N5		N5	N5	SC1

S5 choices

Pupils attempting 1, 2 or 3 Highers could be doing a different number of N5 subjects. It all depends in which column **Options** places their Highers.

S6 choices

Further considerations may be required if S6 pupils are allowed to have a Free Column or have fewer teaching periods for AHs.

Summing Up

Choices	1	2	3	4	5	6	7	R 1	R 2	
5 Highers	Blank 1	Blank 2	H	H	H	H	H	R1	R2	Options chosen in order of preference
4 Highers	B1	SC1	H	H	H	H	N5	R1	R2	The Short Course may need to change to a Blank depending on placement of Highers
3 Highers	SC1	SC2	H	H	H	N5	N5	R1	R2	A third N5 may be possible - if desired. A short course may need to change to a 'blank'.
2 Highers	B1	H	H	N5	N5	N5	N5	R1	R2	Two short courses instead of a N5 may be possible.
1 Higher	SC1	H	N5	N5	N5	N5	N5	R1	R2	Another N5 course could be possible
0 Higher	N5	N5	N5	N5	N5	N5	N5	R1	R2	A short course will automatically be given to pupils in this situation.

The table above details the best way to enter pupil choices into the **Options** Software. It is not an exact science due to the number of permutations that are possible.

TOOLS – The school has not used this. If they did and Guidance Staff were involved in the choice process then it would not be difficult to give pupils the appropriate number of Blank or Short Courses. If **TOOLS** was only used by the Pupil/Parent then this would be more problematic.

There is some guess-work in the above table as the software determines the best column structure. Once the software has created the structure some 'Blanks' may need to change to Short Courses and vice-versa.

The **Options** software does not know about the complications with this model. Eg. A pupil cannot have a Higher Choice in Block A and a N5 Choice in Block B.

So, when using **Options** or **TOOLS** it is important that the 'Blank' or short Courses are entered first. It is imperative that these choices fit into Columns B and D so need to be included in the 'seed' in **Options**. Hence the need to put these into **Options/TOOLS** as a first/second choice.

Appendix 2

Queen Anne High School in Dunfermline is a bigger school (1800 pupils) and runs a very similar model but is unable to run S4 Core and S56 Core sections at the same time. In their version S4 core and S56 core were run at different times, as shown below.

This meant that S56 courses in Column D had to be considered carefully - especially the N45 sets.

	A	B		C	D	E		F	G		H
	A(4)	a(2)	c(2)	C(4)	D(4)	d(2)	f(2)	F(4)	G(4)	g(2)	H(2)
S56	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	S56 Core
	+	+	+	+	+	+	+	+	+	+	
+	H	H	H	H	H	H	H	H	H	H	
	+	+	+	+	+	+	+	+	+	+	
S4	N45	S56 - N45		N45	N45	S56 - N45		N45	N45		
		S4 - N45			S4 Core	S4 - Eng S4 - Mat				S4-Mat S4-Eng	S4-Mat S4-Eng

For more about timetabling S456 please see the article on “Using **TimeTabler** to timetable S4/5/6”, which is in the KnowledgeBase in our Help & Support Centre:

As well as details about using the TimeTabler program for S4/5/6 it also includes 2 Case Studies (pages 16, 17) of schools with a joint S456 in Aberdeenshire and in Highland.

See also the list of 16 documents at www.timetabler.com/scotland

Our thanks to Barbara Lee and the Staff of Lesmahagow High School, and to Queen Anne High School Dunfermline, and to Neil Farquharson, Timetabling Consultant.