



## DEVELOPING THE TIMETABLE

### Notes and Activities for the Beginner Timetabler: Part 3

**Resource Series: Effective Timetable Planning in Schools: User Manual**

**This resource should be used together with:**

- [General Concepts : Notes and Activities for the Beginner Timetabler: Part 1](#)
- [Timetable Inputs : Notes and Activities for the Beginner Timetabler: Part 2](#)

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Now adapted for the Thutong Education Portal by DEVED Trust.

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## 1. INTRODUCTION

### WELCOME BACK!

In Part 2 we completed all our calculations. We're now ready to allocate learning areas/subjects per class per grade to the relevant educators; bearing in mind the workload for each educator that was arrived at via Activity 3 in Part 2.

You should also have in front of you the record sheet that was completed indicating educator teaching details and specialisation.

We'll be using forms specially designed by the Deved Trust to take our process further. As we go along please complete the information asked for on the forms using your school data.

## 2. INTENDED OUTCOMES

- To implement the method of allocating subjects and classes to educators as discussed
- To be able to construct a primary school timetable
- To be able to follow the process of reconciliation before constructing a high school timetable

### 3. ALLOCATION OF TIME AND RESOURCES

#### 3.1 SUBJECT SELECTION

This step requires that you select the subjects that are taught at your school. You'll also choose a method that suits you best for the identification of your educators on the timetable board.

In the *GET* band, for the Intermediate and Senior Phases, the RNCS indicates the Learning Areas, and for the *FET* band, the National Curriculum Statement for Grades 10 - 12 lists the subjects.

In *FORM 2* you are asked to list the subjects offered at your school. *OBE Learning Areas* are National and are therefore listed already.

Should yours be a high school complete the list by naming the subjects offered at your school.

The form also requires you to list all other subjects that would be appearing on your timetable, e.g. sports, assembly

#### **FORM 2 List all the subjects taught at your school**

<b>OBE Learning Areas Intermediate &amp; Senior</b>
Arts and Culture
Economic and Management Sciences
Social Sciences
Life Orientation
Natural Sciences
Mathematics
Technology
Language 1 -
Language 2 -
Language 3 -

<b>FET Subjects</b>
English First language
English Second Language
Afrikaans First Language
Afrikaans Second Language
Mathematics
<b>Other Subjects e.g , Sport, Assembly, etc</b>

**3.2 EDUCATOR CODES**

There are numerous methods used by timetablers for identification of educators on the timetable board. Our method is to take the first four/five letters of the educator's surname, e.g.:

- Ms Karen Solomons = SoloK
- Mr Derek Solomons = SoloD
- Ms Zandile Khumalo = KhumZ

Please complete Form 2.2 below selecting a code for each of your educators and enter other information asked for.

**FORM 2.2 List all the educators at your school**

<b>Educator Code</b> e.g. SMITA	<b>Surname, Initials and Title</b> e.g. Smith A Mrs.	<b>Post Level</b> e.g. P3	<b>Assigned Register Class</b> e.g. 8A

#### 4 LEARNING AREA/SUBJECT & CLASS ALLOCATION TO EDUCATORS

This step involves distributing LA/Subjects to educators for particular classes in particular grades for the specified number of periods.

In Part 2, 6.1, you completed a record of your educators' subject specialisation and teaching experience. Using this information, and after consultation with relevant educators, you can now start your learning area/subject and class allocation.

We've completed an example of an educator teaching allocation on the form below. Please do the same for your school. You need to make photocopies of Form 3.1 so as to complete one per educator, i.e. 20 educators = 20 forms

- Each subject and Grade that an educator teaches must be placed on a separate line. Unless there is a cross grade Group / Tie period (e.g. 8A and 9A going to an educator at the same time for a Group / Tie subject)
- An educator cannot teach more lessons in a cycle than the total of that cycle e.g. 5 days x 10 periods = 50 classes (100%)
- Ensure the distribution of learning areas/subjects and periods is fair for all educators, bearing in mind that principals, deputies and HODs generally have a lighter teaching load



**FORM 3.1 Example Sheet 1 of Educator teaching allocations**

<b>Educator</b>	<b>Mrs A Smith</b>	<b>Educator Code</b>	<b>SMITA</b>
<b>Subjects</b>	<b>Classes</b>	<b>Periods</b>	<b>Total</b>
<b>English</b>	<b>8A + 8B</b>	<b>8 x 2</b>	<b>16</b>
<b>English</b>	<b>9A + 9B</b>	<b>8 x 2</b>	<b>16</b>
<b>Tech</b>	<b>9A</b>	<b>6</b>	<b>6</b>
<b>Tech</b>	<b>8A</b>	<b>6</b>	<b>6</b>
<b>Total number of periods this educator is teaching</b>			<b>44</b>

**Example Sheet 2**

<b>Educator</b>	<b>Mr A Nkosi</b>	<b>Educator Code</b>	<b>ANkos</b>
<b>Subjects</b>	<b>Classes</b>	<b>Periods</b>	<b>Total</b>
<b>Mathematics</b>	<b>8A</b>	<b>9</b>	<b>9</b>
<b>Mathematics</b>	<b>8B</b>	<b>9</b>	<b>9</b>
<b>Mathematics</b>	<b>9A</b>	<b>9</b>	<b>9</b>
<b>Mathematics</b>	<b>9B</b>	<b>9</b>	<b>9</b>
<b>Total number of periods this educator is teaching</b>			<b>36</b>

Below is a sample page of FORM 3.1 which can be photocopied so that you'll have enough forms for all your educators:

**FORM 3.1 ALLOCATE SUBJECTS & CLASSES TO EDUCATORS**

Educator		Educator Code	
Subjects	Classes	Periods	Total
Total number of periods this educator is teaching -			

Educator		Educator Code	
Subjects	Classes	Periods	Total
Total number of periods this educator is teaching -			

**MAKE MULTIPLE COPIES OF THIS FORM TO ACCOMMODATE ALL EDUCATORS**

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Once you've completed a form for each educator you are now ready to compile a full list of educators and their total teaching periods.

Please complete your information on **Form 3.2** below. When this is done you'll have the opportunity to identify and number your educators from the busiest to the least busy. Our explanation for this reasoning is that once you do your placing on the board you start with the busiest educator and work down to the least busy. Later, should/when conflicts occur it's easier to play around with educators who have fewer periods.

**List your educators in the first column and enter the total number of periods that each educator has been allocated to teach. In column 4 identify the educator with the most periods, number this educator 1, the second busiest 2, working down to the least busy numbering sequentially**

**FORM 3.2**

Educator Name	Educator Code	Total periods in one cycle	Allocated busiest to least busy educator
<b>Total Educator Periods being taught</b>			<b>(N)</b>

The total number of educator periods you've arrived at here (N) informs you of the number of supervised/actual teaching periods being held in your cycle.

## 5 GRADE CLASSES SUBJECT ALLOCATION

In Number 4 we worked with the educators. Now we're going to work with the grades and classes. By completing the information asked for on **FORM 4** (Grade Form) it's a method of cross-checking with educator distribution and at the same time ensuring that each class in each grade is receiving the maximum (100%) number of periods in the cycle

We've completed an example of the grade form below. Make photocopies of the blank grade form and complete one form per grade for your school. In a primary school, for example, you'd complete a form for Grade 4, one for Grade 5, one for Grade 6 and one for Grade 7. Should your classes be more than the number of columns provided please add extra columns.

### 5.1 COMPLETING GRADE FORMS FOR ORDINARY (OBE) CLASSES

Below is an example of how a Grade Form for OBE classes should be completed:

**FORM 4 EXAMPLE SHEET FOR OBE CLASSES: Subjects to Grade Classes. Here's an example of how the allocation sheet for one grade should be completed:**

Ensure that each Grade Class is allocated the correct number of periods required per cycle. Don't forget to include Locked periods. These would be the periods that occur on the same day at the same time within the cycle for a grade or the whole school (e.g. Sports, Day 3 period 9 & 10, Life Skills Programme, Grade 5, Day 1 period 3 & 4) and Unsupervised periods (e.g. Assembly)

E.G. GRADE 7	Class	7A	Class	7B	Class	7C	Class	7D	Class		Class		Class		Total
Subject	Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		
Home Language	6 - SMIT		6 - SMIT		6 - SMIT		6 - PRIN								24
1st Additional	5- GWEN		5 - GWEN		5 - GWEN		5 - GWEN								20
2nd Additional	2 - MBAT		2 -MBAT		2 - MBAT		2 - MBAT								8
Social Sciences	6 - (Ed M)		6 - (Ed M)		6 - PRIN-		6 - PRIN-								24
Mathematics	9 - SMIL		9 - SMIL		9 - SMIL		9 - SMIL								36
Natural Science	6 – MBAT		6 - MBAT		6 - HARO		6 - HARO								24
Economic & Management Science	4 - LETLO		4 - LETLO		4 - LETLO		4 - LETLO								16
Life Orientation	4 - FRED		4 - FRED		4 - LETLO		4 - LETLO								16
A&C	4- NAIDO		4 -NAIDO		4 - NAIDO		4 - NAIDO								16
Technology	4 - DLAM		4 - DLAM		4 - MBAT		4 - MBAT								16
<b>TOTAL EACH CLASS</b>	50		50		50		50								<b>200</b>

Tick off each time on the Educator Subject Allocation that you have allocated a particular class to a particular educator to ensure that you have not skipped out any allocation. The grand total arrived at on this sheet informs you of the gross number of periods per subject for each grade.

**AFTER THE COMPLETION OF THIS FORM, CLASSES IN THE PRIMARY SCHOOL (Grades 4 - 7) COULD NOW MOVE TO PLACING EDUCATORS ON THE TIMETABLE BOARD**

**5.2 COMPLETING GRADE FORMS FOR GROUP SUBJECT (FET ) CLASSES**

**FORM 4 EXAMPLE SHEET FOR FET CLASSES: Subjects to Grade Classes.** Here's an example of how the allocation sheet for one grade should be completed:

Ensure that each Grade Class is allocated the correct number of periods required per cycle. Don't forget to include Locked periods. These would be the periods that occur on the same day at the same time within the cycle (e.g. Sports, Day 3 period 9 & 10, Life Skills Programme Day 1 period 3 & 4) and Unsupervised periods (e.g. Assembly)

For Group / Tie periods - Indicate on the allocation that the subject is a Group / Tie period (e.g. ring the extra tie periods and **do not** count them in your total for your grade)

E.G. GRADE 10	Class	10A	Class	10B	Class	10C		10D	Class		Class		Class		Total
Subject	Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		
English	8 - ERICS														8
Afrikaans	7 - VILJO														7
Biology	7 - DEVE														7
(Tie 1) Mathematics/	7 - PATH														7
History	(7 - ROCKS)														
(Tie 2) PhysicalScience/	7 - VILIK														7
Accounting/	(7- THAMB)														
Travel & Tourism	(7 - STEYN)														
Tie 3 Geography/	7 - JAMES														7
Typing	(7 - BROW)														
Life Orientation	4 - FERGU														4
Media Centre	2 - PILLA														2
Assembly	1														1
<b>TOTAL EACH CLASS</b>	<b>50</b>														<b>50</b>

Tick off each time on the Educator Subject Allocation that you have allocated a particular class to a particular educator to ensure that you have not skipped out any allocation

**MAKE MULTIPLE COPIES OF THIS FORM TO ACCOMMODATE ALL GRADES. THE FORM IS FOR BOTH OBE AND FET CLASSES**

**FORM 4 GRADE FORMS: COMPLETE AN ALLOCATION FORM PER GRADE**

GRADE:	Class	A	Class	B	Class	C	Class	D	Class		Class		Class		Total
SUBJECT	Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		Periods / Educator		
	/		/		/		/		/		/		/		
	/		/		/		/		/		/		/		
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<b>TOTAL EACH CLASS:</b>															

**NB:** The total per class must be equal to the number of periods per cycle ( i.e. days per cycle x number of periods per day)



## 6. RECONCILIATION BETWEEN CLASS SUPERVISED PERIODS AND EDUCATOR TEACHING PERIODS (MAINLY FET)

In the process of timetabling in the FET phase, timetablers have to accommodate the different choices that learners make. It may so happen that in one grade class learners' choices result in a variety of combinations having to be catered for and timetabled. The result of these choices impacts on the human resources at the school. The more combinations; the more human resources called upon and the more complicated the timetable becomes. In our example below we discuss a few types of group/tie subjects. One can see from the explanations the impact on human resources:

Group / Tie subjects are where one class or classes split up during the same teaching period to go to different subjects and educators. There are 4 main variations of group/tie subjects:

### DESCRIPTION TABLE OF VARIOUS TYPES

Type	Description
1	<b>Many to Many Equal - Where the number of classes equals number of Educators i.e. 2 classes split up and go to 2 educators / subjects</b> e.g. During a period, some learners in 8A & 8B go to Maths with Educator X and the remainder go to Accountancy with Educator Y
2	<b>Many to Many Not Equal - Where number of classes and educators differ i.e. 2 classes to 3 educators / subjects (or 3 to 2, etc)</b> e.g. During a period, some learners in 8A & 8B go to Maths with Educator X some go to History with Educator Y and the remainder go to Accountancy with Educator Z
3	<b>One to Many - Where 1 class goes to 2 or more educators / subjects</b> e.g. During a period, some learners in 8A go to Maths with Educator X and the remainder go to Accountancy with Educator Y
4	<b>Many to One - Where more than one class goes to one educator / subject</b> e.g. During a period, all the learners in 8A & 8B go to Sport with Educator X

Nowadays a variety of software packages on the market are designed to resolve all the complications of combinations, group/tie subjects and timetabling can now be completed within a few hours. But, for our rural schools with no electricity and disadvantaged schools with minimal financial resources unable to purchase such packages, the timetabling process is still a manual one to the very end.

The reconciliation process discussed below is of benefit to all timetablers as it explains the difference between educator periods and the supervised periods in a cycle. We believe that if this process is completed it reduces the number of conflicts that could occur when placing of educators and classes start.

We'll make use of our forms to discuss this. Our choice of terminology is *Group/Tie Subjects*. The first step in reconciliation is to list all the LOCKED periods your school may have, i.e. when all the learners in the *grade or school* go to the same subject/event e.g. all the Grade 4 classes to Music every Day 3, period 5 or the whole school to Sports on Day 4, period 9 & 10.

#### FORM 5 LIST ALL YOUR LOCKED PERIODS HERE

Grade/s	Subject	Day/s	Periods
e.g. All classes	Assembly	1	1
All Classes	Sport	4	2
			<b>Total:</b>

The next step of the reconciliation process is to list all the group/tie subjects for every grade. We'll use the group/tie subjects from **FORM 4** as example.

**FORM 6**

Enter the **TIES** for your school. NOTE: For every **GRADE** with the same tie subjects, you must add a new **TIE No.**

TYPE (refer descripti of types above)	TIE No.	Grade & Class	Name of Group / Tie Subject	Code to appear on Timetable	Group / Tie Subject 1	Group / Tie Subject 2	Group / Tie Subject 3	Group / Tie Subject 4	Group / Tie Subject 5	Number of Periods
3	T1	10A	Mathematics/History	Math/Hist	Mathematics	History				7
3	T2	10A	Physical Science/Accounting/ Travel & tourism	PhySc/Acc /TT	Physical Science	Accounting	Travel & Tourism			7
	T3									
	T4									
	T5									
	T6									
	T7									
	T8									
	T9									
	T10									
	T11									
	T12									
	T13									
	T14									
	T15									

Please Note - Across grade group / tie periods must be allocated to one Tie No. (E.g. 10A and 11A to Sport with 1 Educator)

The information from FORM 6 feeds into FORM 7 below and the following calculation is done:

Calculation (Refer to *Description of Types* table to identify type)

If Type 1 THEN R is equal to zero e.g.:

2 educators (O) - 2 classes (P) X periods = R

$2(O) - 2(P) = 0 \times 5(Q) = 0$

If Type 2 to 4 THEN R is equal to (O minus P) times Q

Once you've completed Form 6 use this information to do the calculations to complete Form 7 below:

## FORM 7

Calculation of Group / Tie Subjects

Type	Tie No	Number of Educators O	Number of Classes P	Number of Periods Q	Calculation R
3	T1	2	1	7	7
3	T2	3	1	7	14
	T3				
	T4				
	T5				
	T6				
	T7				
	T8				
	T9				
	T10				
	T11				
	T12				
	T13				
	T14				
	T15				
Total for Group / Tie periods Calculation S					21

We continue with our calculations by completing FORM 8 which asks that all unsupervised periods be listed. Unsupervised in this instance means that all educators and all learners are involved in the event, but no one-to-one supervision occurs, i.e. no educator is allocated.

**FORM 8** List all unsupervised periods

Unsupervised Period e.g. Assembly	Timetable code e.g. ASSEM	Individual Grade & Classes e.g. 1A, 1B	Number of Periods per Cycle	Total Classes times periods e.g. 2x5=10
Assembly	ASSEM	1A, 1B, 1C	1	3 x 1 = 3
Assembly	ASSEM	2A, 2B,	1	2 X 1 = 2
<b>Total Unsupervised Periods for the Whole School</b>			<b>T</b>	<b>5</b>

What we're doing here is working out the various periods and their impact on the timetable:

- supervised periods affect educator teaching loads while unsupervised periods don't
- group/tie periods create extra supervised periods

In FORM 9 you're shown how to reconcile all these periods so that your timetable "*balances*". To complete FORM 9 you'll require totals that have been calculated already. These are:

1. Total number of periods supervised by educators (Form 3.2). **Code N**
2. Total number of periods in cycle for entire school (Answer **M**, page 21, Part 2)
3. Total number of extra periods created by group/tie periods (Form 7). **Code S**
4. Total of all unsupervised periods (Form 8). **Code T**

The idea of the periods "balancing" is to arrive at a nil answer. This informs us then that there are no periods floating around unaccounted for. With all the required information for your school on hand complete FORM 9

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**FORM 9**
**Reconciliation between Class Supervised Periods and Educator teaching periods**

<b>Total Periods Supervised by Educators i.e. Total of all educators teaching loads</b>	<b>Per N above</b>	
<b><u>Less:</u>  Total number of periods for all classes in the school in a cycle</b>	<b>Per M above</b>	
<b><u>Less:</u>  Total extra Group / Tie periods</b>	<b>Per S above</b>	
<b><u>Add:</u> Total of all Unsupervised Periods i.e. All periods where no educator allocated</b>	<b>Per T above</b>	
<b><u>Equals:</u> Difference - Should be NIL <math>( N - M - S + T )</math></b>	<b>U</b>	

Once your periods "balance", you can move to the board and start placing your educators. Thought should also be given to the placing process as double periods, physical resources need to be considered.

## 7. RESOLVING CONFLICTS IN THE TIMETABLE

As has been mentioned before, this laborious task of sorting out conflicts on the timetable has been simplified by the use of software packages. Nevertheless, we do believe that timetablers over the years have devised many ways and methods of dealing with conflicts on the timetable and that each school has a member who is tasked with this resolving because of the individuals skills.

## 8. MULTIGRADE CLASSES

Multigrade classes are timetabled when ONE educator teaches two or more grades one subject simultaneously in the same room.

An example of such a group is:


Educator:	MSIM
Grades in group:	4A, 5A, 6A
Subject/s in group:	Social Sciences

## 9. ISSUING AND DISPLAYING THE TIMETABLE

Below is a screen print example of completed timetables from a software programme. On the left the educator's timetable is displayed, on the right the class timetable is displayed. In schools without computers educators would normally be called in to write out their personal, as well as their class timetables from the Master timetable which would be on display in one of the offices.

### Timetable classes

Select Educator: **DUIS** | Select Class: **8A** | Select Subject:



**Timetable for : DUIS**

Click on the Educator grid to place the subject

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
1	Class busy	Class busy	8B TECH	5A MMMS(j)	5B MMMS(s)	7B
2	5A MMMS(j)	5B MMMS(s)	Class busy	5B MMMS(s)	5A MMMS(j)	5B MM
3	5A MMMS(j)	5A MMMS(j)	8B HSS	7B HSS	8B TECH	8B
4	5B MMMS(s)	8B HSS	5B MMMS(s)	7A HSS	6A FLIX	7B
5	5B MMMS(s)	8A HSS	5B MMMS(s)	8B HSS	8B HSS	8A
6	8B HSS	7A HSS	Class busy	Class busy	5A MMMS(j)	5A MM
7	8B TECH	7B HSS	5A MMMS(j)	8A LLC(s)	5B MMMS(s)	7A

**Timetable for : 8A**

Click on a Subject on the class grid to see related timetables

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
1	ASSE	TECH	LLC(s)	NS	LLC(s)	MMMS
2	HSEM	LLC(s)	LO	HSEM	LLC(s)	MMMS
3	NS	NS	MMMS(j)	MMMS(s)	NS	HSEM
4	LLC(s)	LLC(s)	LLC(s)	LLC(s)	AC	LLC(s)
5	LLC(s)	HSS	HSEM	LLC(l)	LLC(s)	HSS
6	TECH	MMMS(j)	NS	LLC(s)	TECH	LLC(s)
7	LO	AC	LO	LLC(s)	MMMS(j)	TECH

**Green: Tie/Combined Periods    Magenta: Admin/Locked Periods    Red: Class or Educator is unavailable - this period can be removed**



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## 10. CONCLUSION

Your timetable is complete. Thank you for joining us.

If this is the first time that you've attempted the task of timetabling, please don't let it be your last. Repeat the processes we've led you through until you understand them well enough to offer your services to your school's timetabling committee.

You can realise that our interpretation of timetabling is very detailed. From experience gained in training timetabling at schools, we believe that if concepts/basics of timetabling are not understood then school timetables are not being constructed from a knowledgeable point of departure and real skills are not acquired.

We wish to emphasise that this three-part timetabling series expresses the methods/processes that the DEVED TRUST uses in its training.

Our training is two-pronged:

- The computerised component for schools with computers
- The manual training for schools without computers

We'd appreciate any feedback you have that you believe could enhance our processes of timetabling.

THANK YOU

DEVED TRUST