Untis
GRUBER & PETTERS

Untis

Lesson planning

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1 Introduction

This chapter is not just intended as an introduction but also as a reference manual for the modules lesson planning and value calculation. It therefore contains a description of everything required for scheduling lessons and calculating values .

All Untis users will benefit from the first three sections of the Teachers' work chapter. They contain everything required by a timetable scheduler who also is responsible for planning the deployment of teachers. The ' Teacher's yearly work ' feature, described in the final section of this chapter, is currently used mainly in the Netherlands.

Many planning functions such as ' Lesson comparison ' or functions for the automatic assignment of teachers 'are certainly very useful but have been skipped in the initial section covering familiarisation with the system and are described later in the ' **Planning tools** ' chapter.

Lesson planning becomes really challenging when lessons are evaluated and weekly periods are not just counted. If you have (so far) managed without value calculations, you are in the fortunate position that you can omit the second part of this manual which is concerned with value calculation.

If, on the other hand, you require value calculation you are also in a lucky position, as you now have the valuable assistance that Untis provides. You will not require everything described here - **yearly percentage calculation** is, for example, something very special - but reading through the appropriate chapters will be extremely worthwhile.

The final chapter 'Value calculation with the multi-week timetable module' deals above all with those problems created by time-limited or other non-yearlong lessons when planning teacher deployment. These types of problem are likely to become increasingly important in the future.

2 Overview

One of the biggest administrative tasks when planning the new school year is the allocation of all the work among the teaching staff.

The following must be considered:

- The teachers must accomplish a certain workload. This target value depends on the type of school and the national school system, but also sometimes on the age and training level of the teacher. Usually the number of lessons to be held per week (e.g. 24 lessons per week for a full-time teacher and 12 for a teacher with a part-time contract) are entered. There are duties that do not appear in the timetable but which are part of the weekly working hours (school management, subject mentoring, library administration etc.). Such duties are taken into account in the form of reductions .
- A teacher must be found with the appropriate teaching qualification for every lesson that is to be held.
- In order to guarantee the students continuous education a teacher should if possible accompany a class over several years .
- The workload must be distributed among all the teachers fairly and evenly. This applies both to teaching as well as to those duties that are included in the working hours in the form of reductions.
- When scheduling, the task of calculating the workload is often complicated. The value of a lesson frequently depends on the subject , class level or even on the teacher 's contract of employment.
- Screen masks and reports should give insight into the details but at the same remain as clear and

comprehensible as possible.

The Untis 'Lesson planning and value calculation' module assists you with this task by providing the following functions:

- **Teaching qualification** : You can enter those (groups of) subjects for every teacher that he/she is allowed to teach.
- **Teacher suggestion** : For each lesson you can have Untis propose teachers who are eligible to teach it.
- **Teacher assignment** : You can also have Untis automatically perform the assignment of teachers .
- **Subject bottlenecks** : Subjects for which there are (too) few qualified teachers cause problems when planning lessons. The 'subject bottleneck' function determines possible bottlenecks in lesson planning.
- **Lesson matrix** : Allows an overview of how lessons are distributed in the form of a matrix.
- **Lesson table** (syllabus) : By defining the school type this view helps you to check whether each class of a certain school type has been allocated the prescribed number of weekly lessons in each subject.
- **Value calculation** : Lesson planning is always particularly difficult when lessons for different subjects are weighted differently, e.g. when a maths lesson is 'worth more' than a music lesson. Untis lesson planning allows you to enter the information you require for value calculation for the subjects, classes, teachers and lesson. You can find the total values for the whole school that are important for statistical purposes on their own index card.

3 Part 1: Lesson planning

This section explains in detail the following topics:

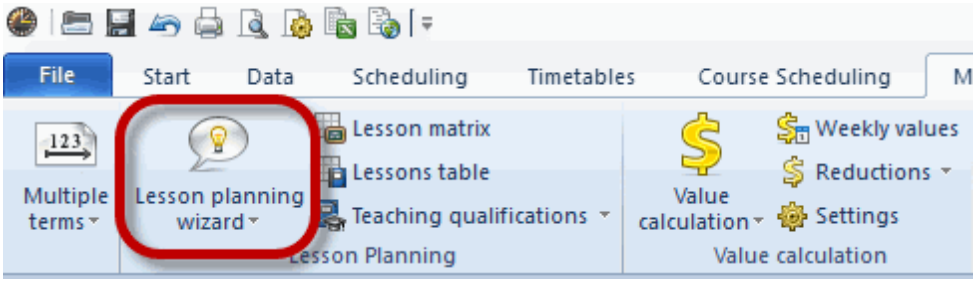
Teachers' work

- Target teaching lessons
- Reductions
- Lessons for teachers
- Teachers' yearly work

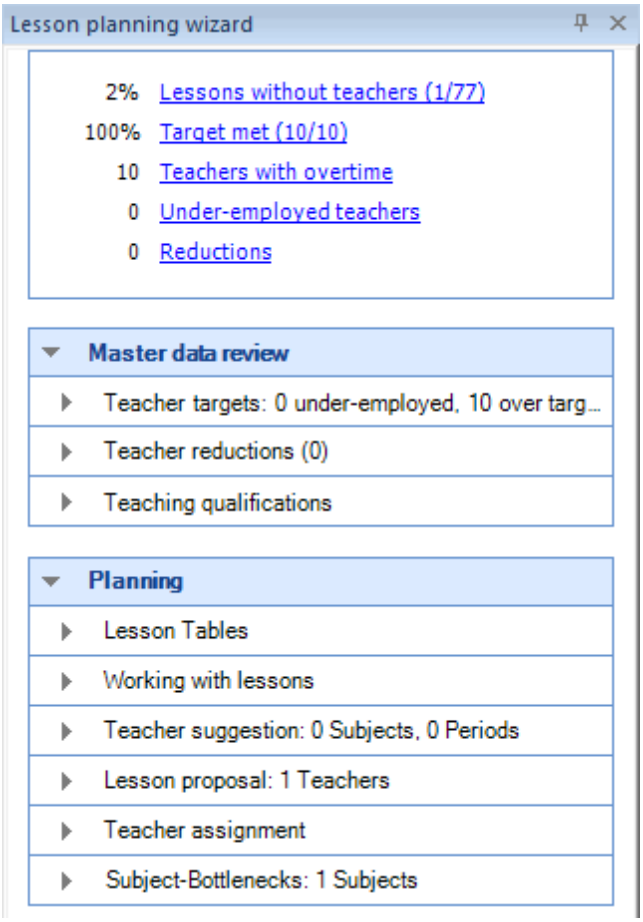
Scheduling tools

- Lesson matrix
- Lesson table (syllabus)
- Automatic teacher assignment

Lesson planning wizard



You also can get to the different topics via the lesson planningwizard. It assists you with window groups which have already been set up, in which respective colums are shown and appropriate filters have been set. You find the lesson planning wizard on the 'Module' tab in the section 'Lesson Planning'.



3.1 Teachers' work

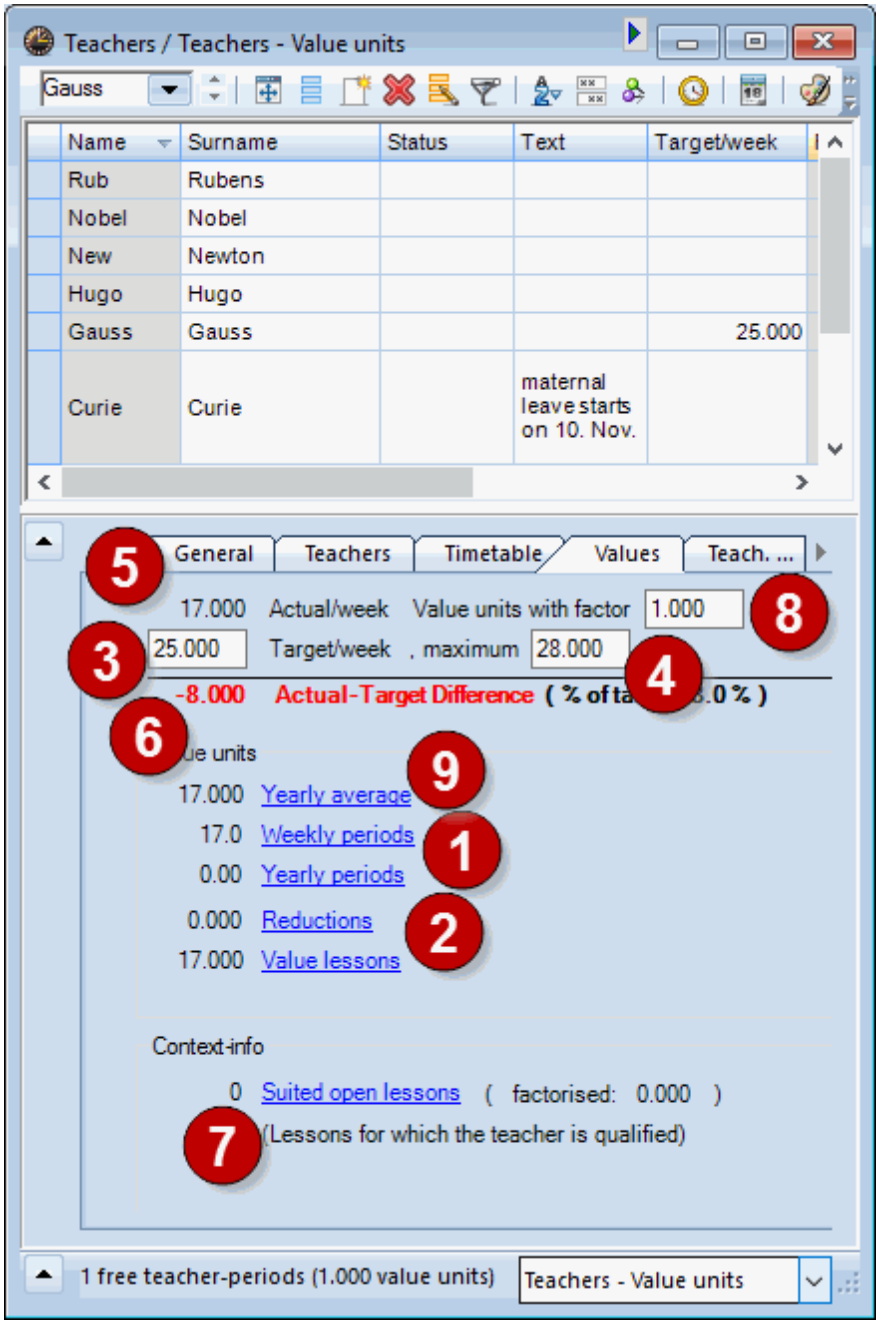
This chapter describes how you can use Untis to manage a teacher's workload. This involves not just the lessons to be held but also the various additional duties that a teacher performs (e.g. supervision of teaching material or administration of the school library). Such duties are grouped under the term 'Reductions'.

- Target teaching lessons

- Reductions :
- Lessons for teachers
- Teachers' yearly work

3.1.1 Target teaching lessons

Open the view 'Teachers | Master data' from the file demo2.gpn, expand the form view and switch to the 'Values' tab.



The values entered and displayed in this window are principally concerned with value calculation and are

described again in detail in the corresponding chapter.

If you do not use the value calculation part of the lesson planning module - that is, if you have not entered any factors for subjects, classes or teachers - the number of periods per week and the value units are equivalent for Untis.

At this point only the following input elements and displayed values are important:

1. Periods/week: Here you can see how many lesson periods have been scheduled for the teacher.
2. Reductions: The actual weekly value does not just include lessons held. This will be explained in more detail in the ' Reductions ' chapter.
3. Plan/week: Enter the desired workload for the teacher in periods per week (e.g. 25 periods per week).
4. Plan/week max: This value only plays a role if you intend using automatic teacher assignment .
5. Value units : The scheduled weekly periods for a teacher can differ from the actual weekly periods as a result of factors or reductions .
6. Actual-planned: This indicates the difference between the teacher's target weekly periods and the actual scheduled workload. A negative value means that the teacher has not yet been allocated his/ her target.
7. Free for teacher: This field displays the number of periods which have not yet been allocated a teacher and which the current teacher is qualified to take. You will find a more detailed description of the topic teacher qualification in the corresponding section.
8. Factor You can use this factor to adjust the values of a teacher. The value that you enter here will be multiplied with the number of periods per week.
9. Yearly average : The yearly average is the average lesson value taken over all terms.

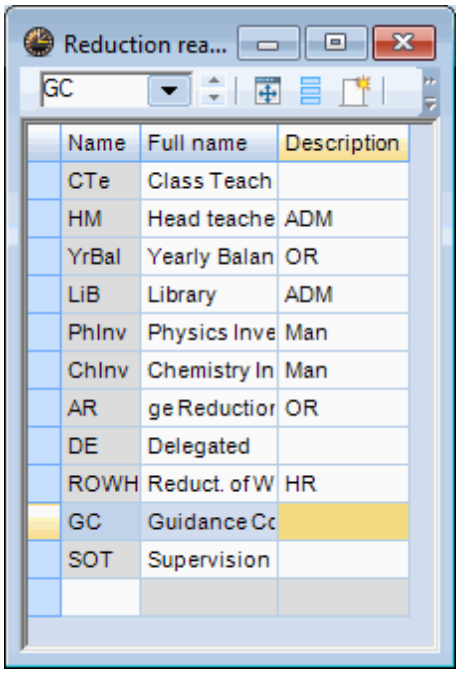
3.1.2 Reductions

A teacher’s workload is not restricted just to teaching - it includes other duties, e.g. school management, supervision of teaching materials, subject mentoring, library administration etc. Such duties can be taken into account by creating reductions.

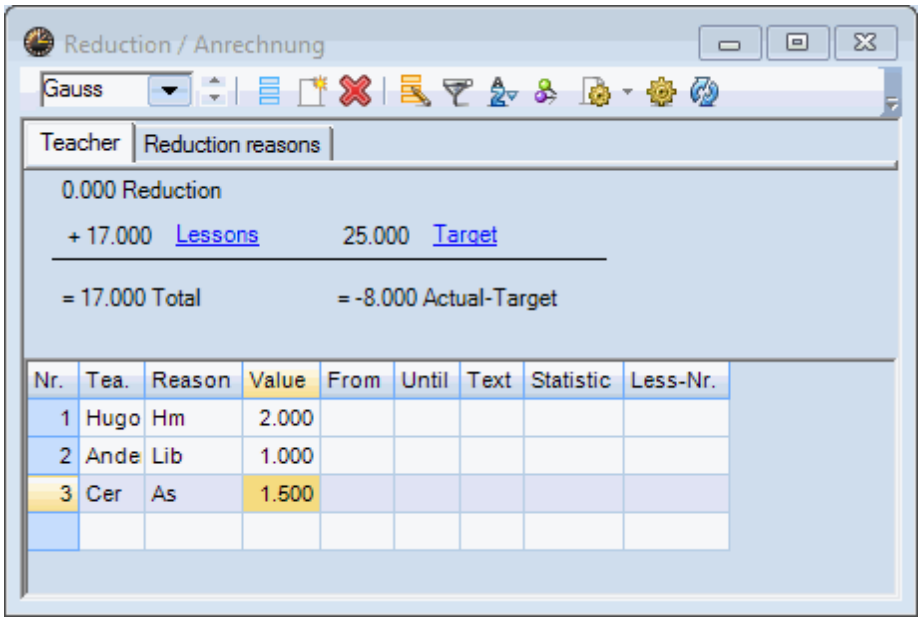
Reduction reasons

You must first define reasons for reductions via the menu 'Reductions' on the 'Module' tab.

The figure below shows the reduction reasons from file Demo2.gpn.



Reductions themselves are entered in the 'Modules | Value calculation | Reductions' window.



The figure shows the reductions for teacher Hugo. For his mentoring duty as class teacher ('CTe') he is credited with 2,000 value units (if you work without value calculation, the number of periods for the week are used). He is also credited with 1,000 value units for supervision of the physics collection (reduction reason:PhS).

If you wish to display the reductions for individual teachers (as is the case in the figure) using the

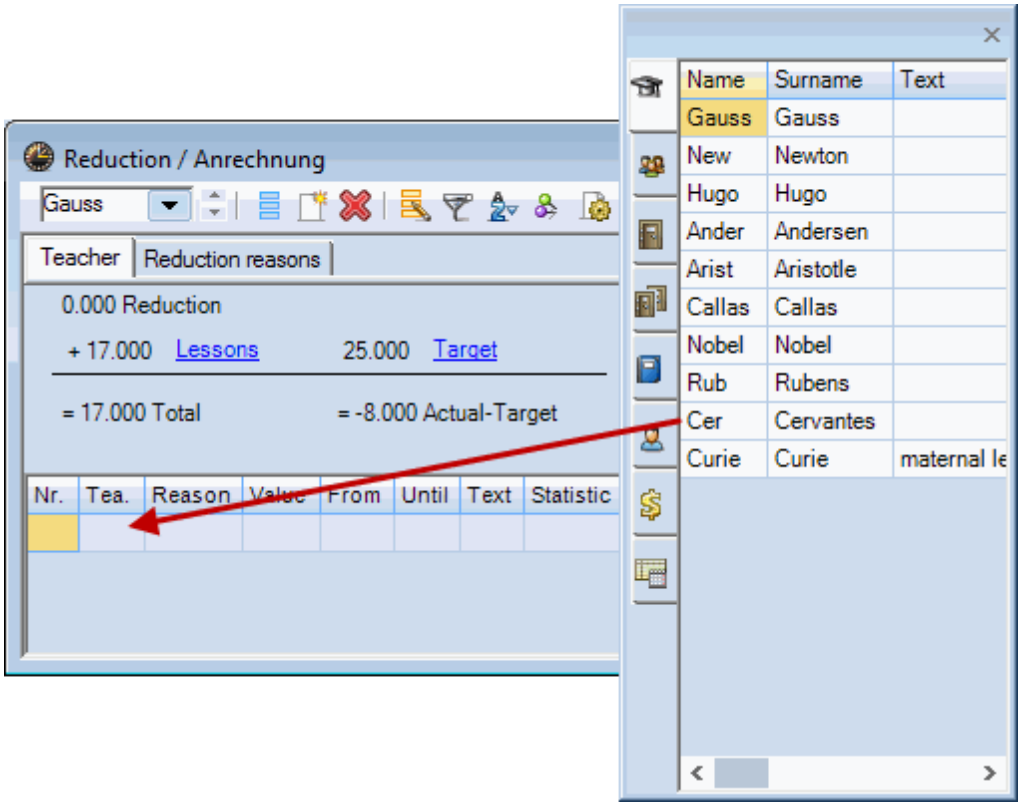
corresponding selection list, you will see how many value units have already been allocated to the teacher.

For teacher Hugo, 3,000 value units in the form of reductions and 23,591 value units of lessons have been assigned. This results in a total of 26,591 value units. He is thus 1,591 value units over his weekly target of 25.000.

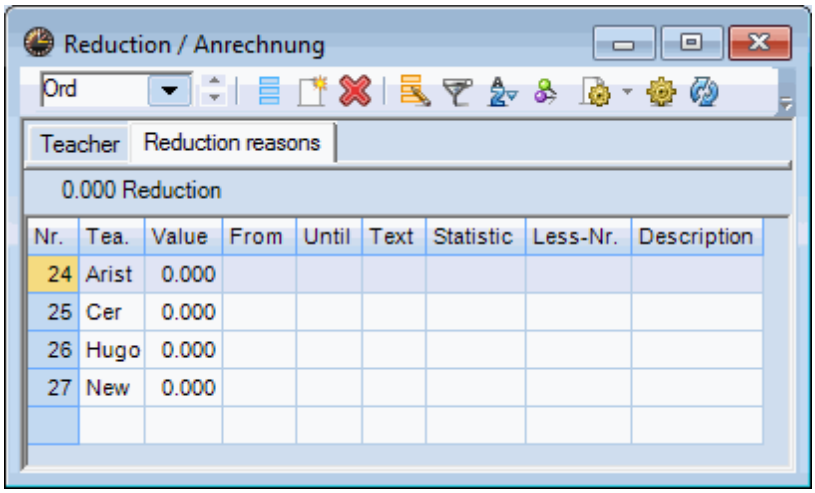
Using drag & drop with teachers and reduction reasons

You can use drag & drop to assign one reduction reason (e.g. mentoring) to several teachers by using the Element-Rollup. To do this, use <CTRL>+click to select the respective teachers and drag them into the reduction reasons window.

In the example, several teachers are assigned a reduction for mentoring as class teachers (CTe').



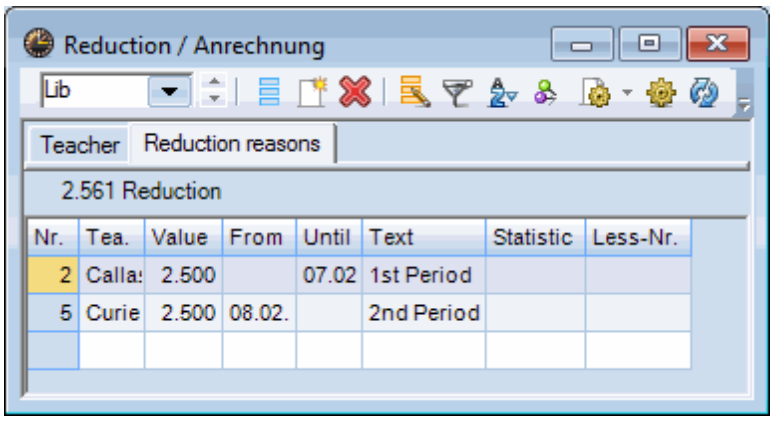
You will now find all the selected teachers under 'CTe' and you can enter values for them.



Conversely, several reduction reasons can be assigned to one teacher.

3.1.2.1 Temporary reductions

You can also limit the time for which reductions are valid. Let us assume that a teacher looks after the library for a semester and benefits from an appropriate reduction. In the following semester she hands over this task to another colleague. The reductions must be entered for both teachers together with the corresponding 'from' and 'to' dates.



The time limitation distributes up the reduction value evenly in the comparison of the teacher's actual and target values (see 'Value calculation').

Warning:
Reductions extend over term boundaries. If you wish to limit the proposal to one timetable period you must enter the corresponding 'from' and 'to' dates.

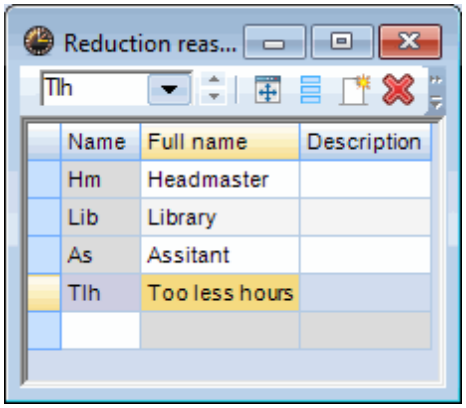
3.1.2.2 Reductions with negative values

Reductions can also have negative values.

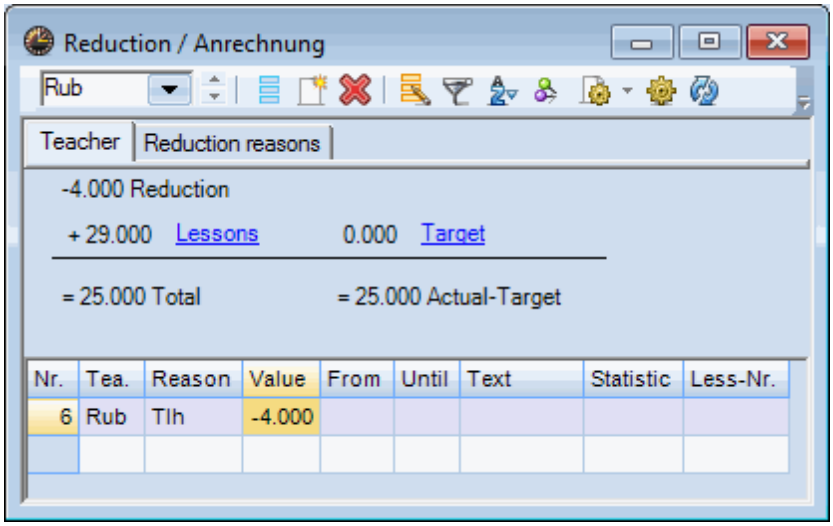
Let us assume that teacher Rubens took 21 weekly periods in the previous school year but that he was

paid for his full contractual commitment of 25 periods. In order to compensate for this underemployment he should teach 29 periods this year but be paid for 25 periods as in the previous year.

First define a suitable reduction reasons, e.g. 'Underemployment in prev. year'.



You can now enter a reduction by simply assigning it a negative value



3.1.2.3 Printing

You can of course also print the list of reductions while you are in the reductions window. The printout or print preview is sorted either by reduction reason or by teacher depend on the settings in the reductions view.

Test school DEMO Timetable 2017/2018 Untis 2017
For demo and test only Valid from: 10 October 5.7.2016 13:14

Reductions

Nr.	Tea.	Reason	Value	From	Until	Text	Statistic	Less-Nr.
1	Callas	Hm	1.500		7.2.2018			
2	Callas	Lib	2.500		7.2.2018	1st Period		
3	Cer	As	1.500					
4	Curie	Hm	2.500	8.2.2018		2nd Period		
5	Curie	Lib	2.500	8.2.2018		2nd Period		
6	Rub	Tlh	-4.000					

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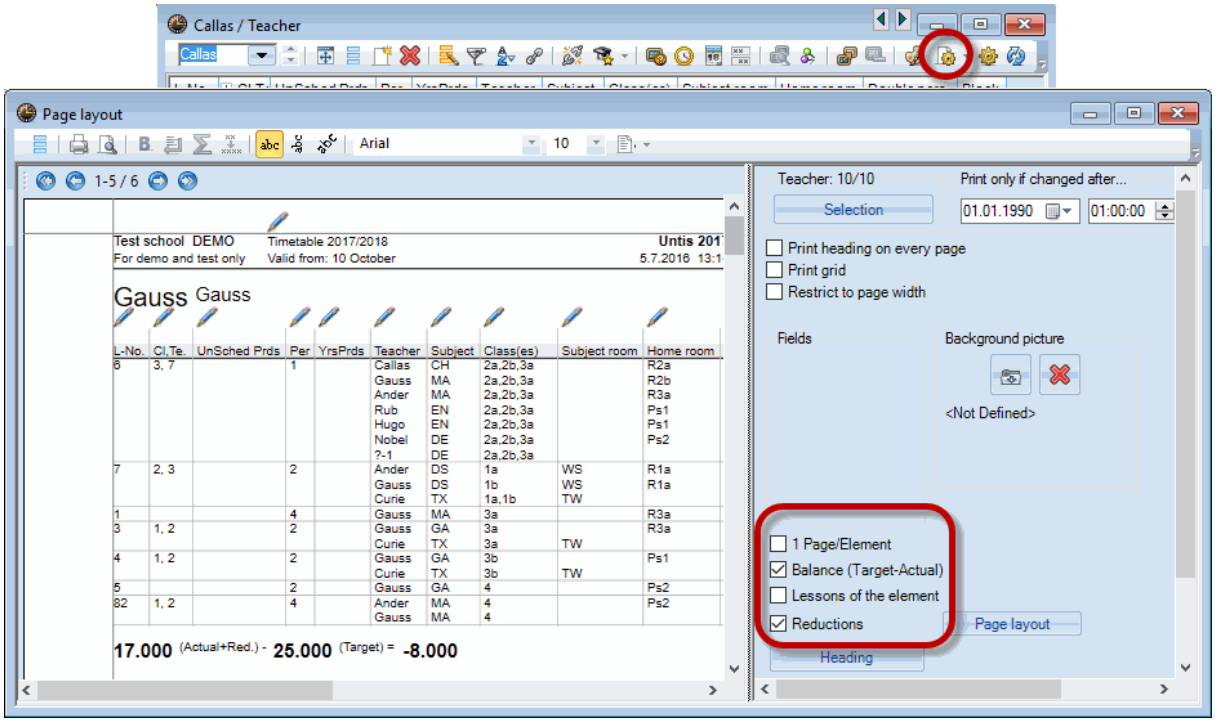
In addition, you can also make reductions visible in the printout of the window 'Teachers | Lessons'. Checking the 'Reductions' option in the page layout window prints out the reductions in the report below the lessons.



3.1.2.4 Balance at year end

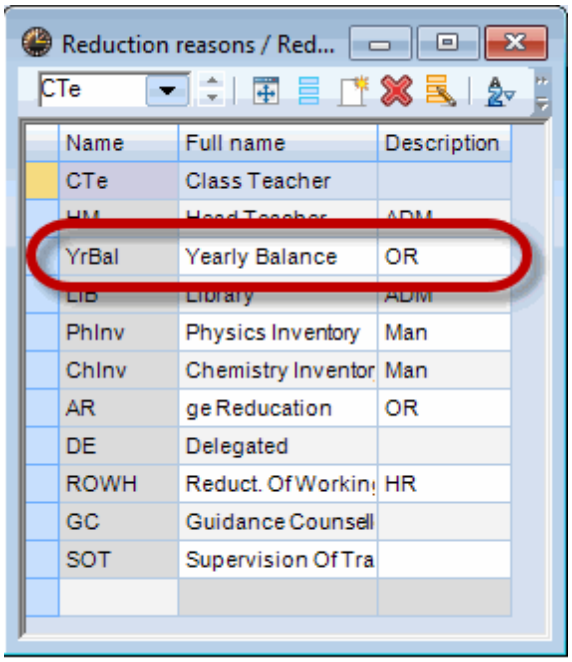
You can have Untis automatically calculate and record the yearly balance as in the previous example.

We will illustrate this with a concrete example:

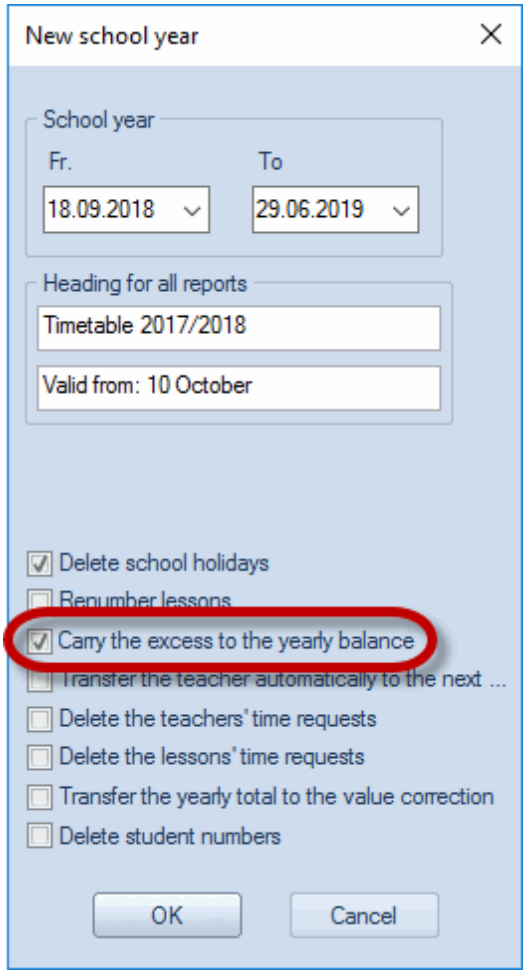
- Open the Demo2.gpn file and for the sake of clarity close all windows (CTRL + K).
- We now want to create the file for a new school year and automatically calculate the yearly balance

values.

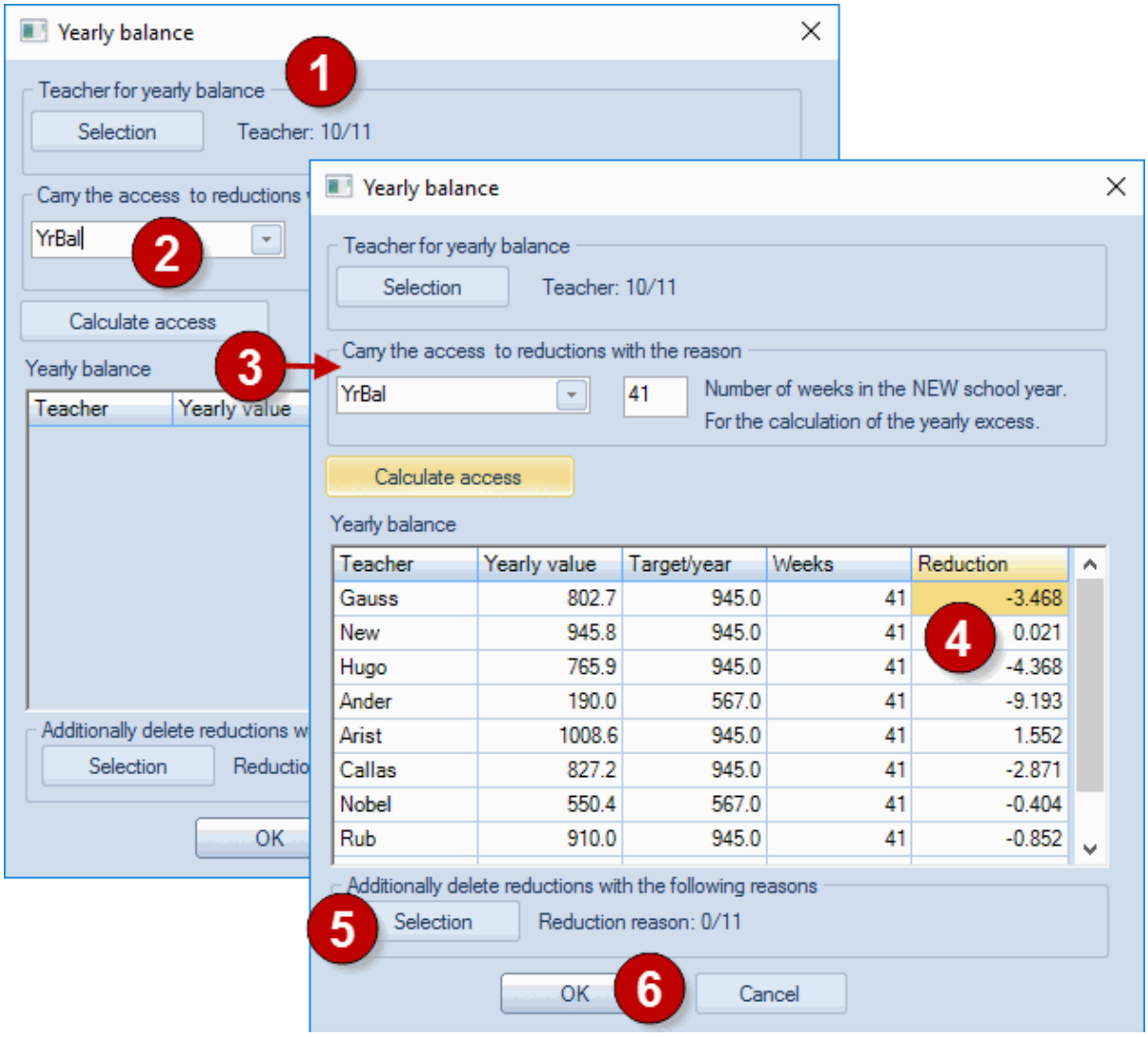
- Please note that the reduction reason 'Balance at year end' already exists under 'Modules | Value calculation | Reduction reasons'.



- Now invoke the <New school year...> function ('File | New school year...).



- Select suitable start and end dates for the new school year with the help of the 'from' and 'to' date fields.
- Now check the option 'Carry the excess to the yearly balance' and confirm with <OK>. The window with the yearly balance will open.



1. First select those teachers for whom the yearly balance should be calculated. Select all teachers apart from the ? teacher.
2. Next, select the reduction reason that should be entered for the yearly balance values In our example we select the reason 'UE'
3. Click the button <Create yearly balance>.
4. The yearly balance list contains suggested reductions for the following school year based on the actual-planned value of the current year. You can edit the suggested values manually.
5. Finally, select those reduction reasons for which all reduction reasons should be deleted from the beginning of the new school year.
6. Clicking <OK> closes the window and makes the modifications to the reductions.

3.1.3 Lessons for Teachers

Untis provides a number of different tools for assigning teachers to lessons.

Teaching qualification

School year change

Manual teacher assignment

3.1.3.1 Teaching qualification

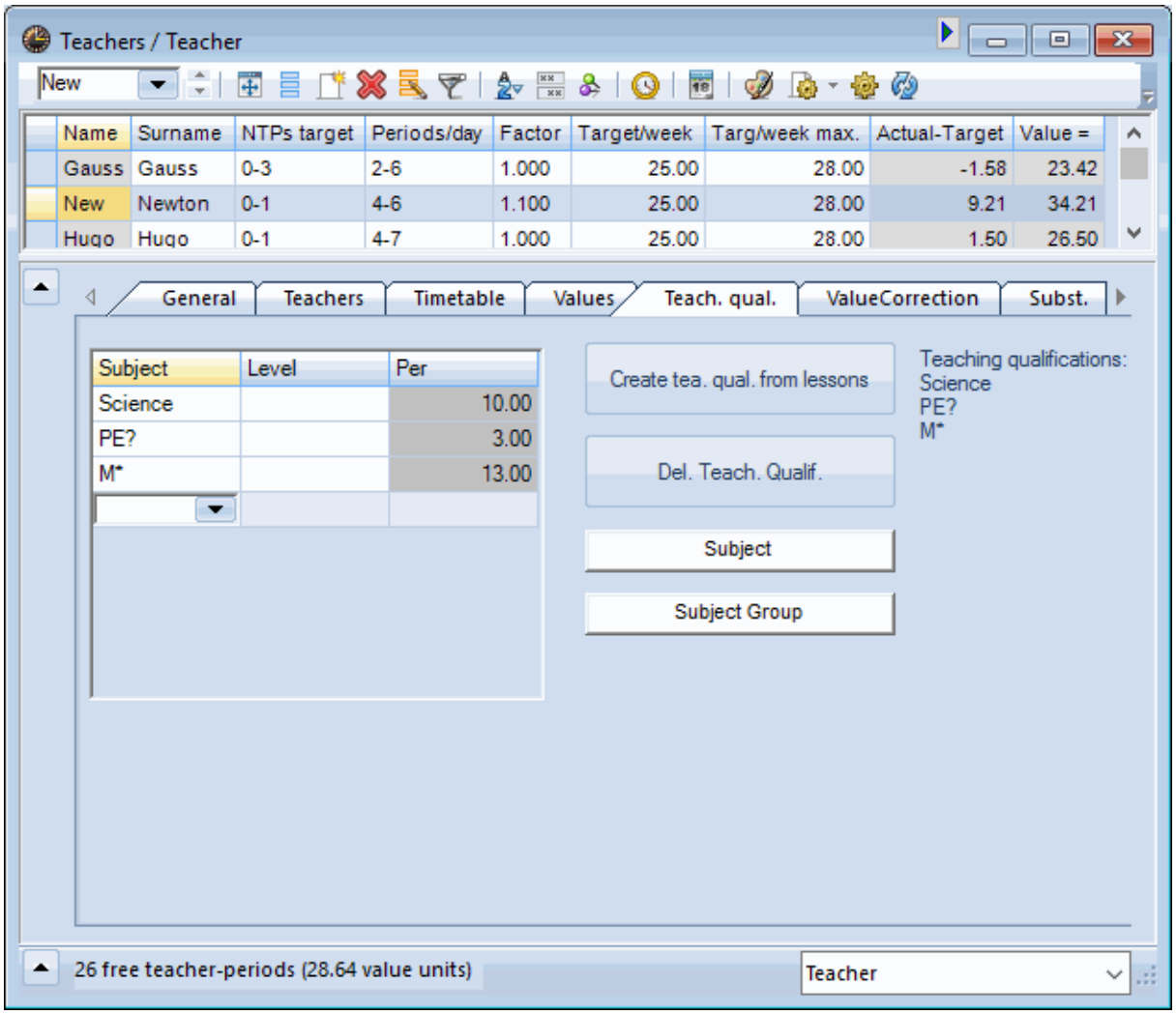
Information on which teachers can teach which subjects is very important for the 'lesson planning' module. On the basis of the teaching qualifications Untis can for example:

- Propose alternative teachers in the event of teacher shortages
- Automatically assign suitable teachers to any lesson before or during optimisation,
- Optimise teaching teams in the case of coupled lessons,
- propose suitable periods that a teacher with too few lessons can take

You can specify which subjects the current teacher may teach on the 'Teach. qual.' tab under 'Teachers | Master data'. Individual subjects can also be combined into subject groups , with a difference being made between implicit and explicit subject groups.

In the upper part of the window (table at the top) the individual teaching qualifications can be shown, but not edited.

You can find the table with the individual teaching qualifications in the teachers' master data on the left of the 'Teach. qual.' tab.

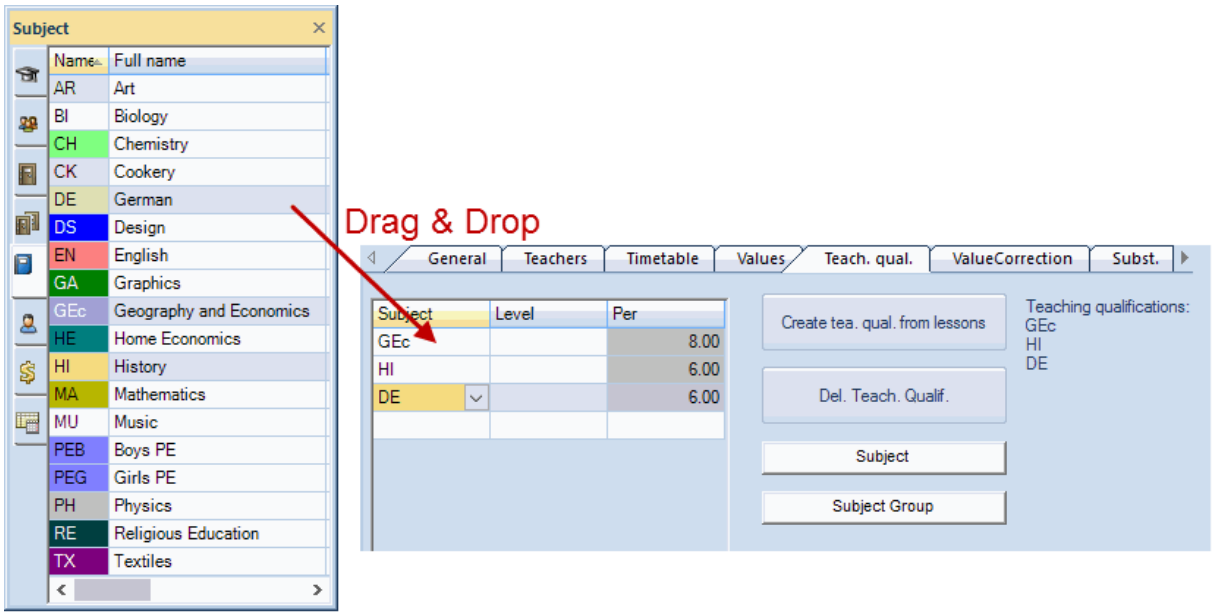


The table columns have the following meanings:

- Subject: In this column enter the subjects or subject groups that that the teacher in question may teach. The figure shows that an explicit subject group (‘Science) as well as two implicit subject groups ('PE?' for 'PEG' and 'PEB' as well as 'Ma*' for all subjects beginning with ‘Ma’) have been defined.

The input here is case-sensitive. An 'm' entered for 'Mathematics' or 'Music' would be interpreted by Untis as a new subject group 'm'.

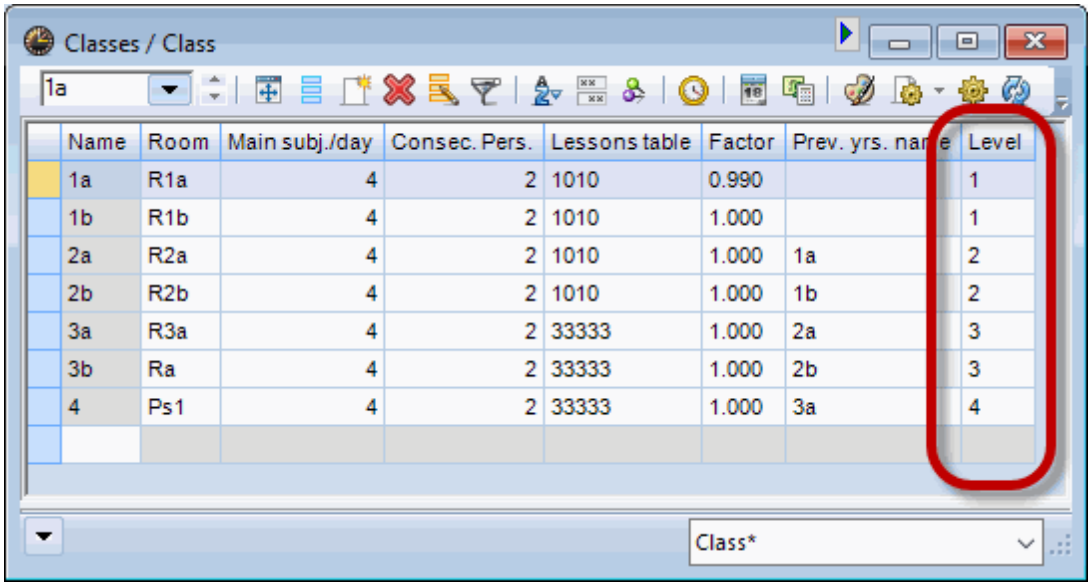
Tip: Element-Rollup
Element-Rollup allows you to enter subjects using drag & drop.



- Per: This field shows how many periods per week the teacher already takes in this subject (or in subjects in the subject group). This column is purely informational; for this reason you cannot enter anything in it.

- Level: Use this column to define the school levels in which the teacher may teach the subject concerned. For example, entering '1-2' would limit the teacher qualification for this subject for classes at school levels 1 to 2.

You can enter the school level under 'Classes | Master Data' in the 'Level' column.



If you delete a subject under 'Subjects | Master Data' for which a teacher qualification has been defined for a teacher, the qualification will also be deleted.

There are a number of buttons next to the teaching qualification table:

- Create tea. qual. from lessons: Clicking this button results in the list of teaching qualifications being automatically created from the lessons that have so far been entered. This assumes that a teacher is qualified to teach every lesson that he takes. Teaching qualifications that have already been entered will not be modified.
- Del. teach. qualif: Clicking on this button results in the lists of teaching qualifications for **all** teachers being deleted. You can delete individual teaching qualifications by selecting the desired row and pressing <DEL>.
- Subject and subject group: You can select colours to differentiate more easily between subjects and subject groups . This is especially useful when similar names are used. The setting has no effect outside the 'Teach qual.' tab.

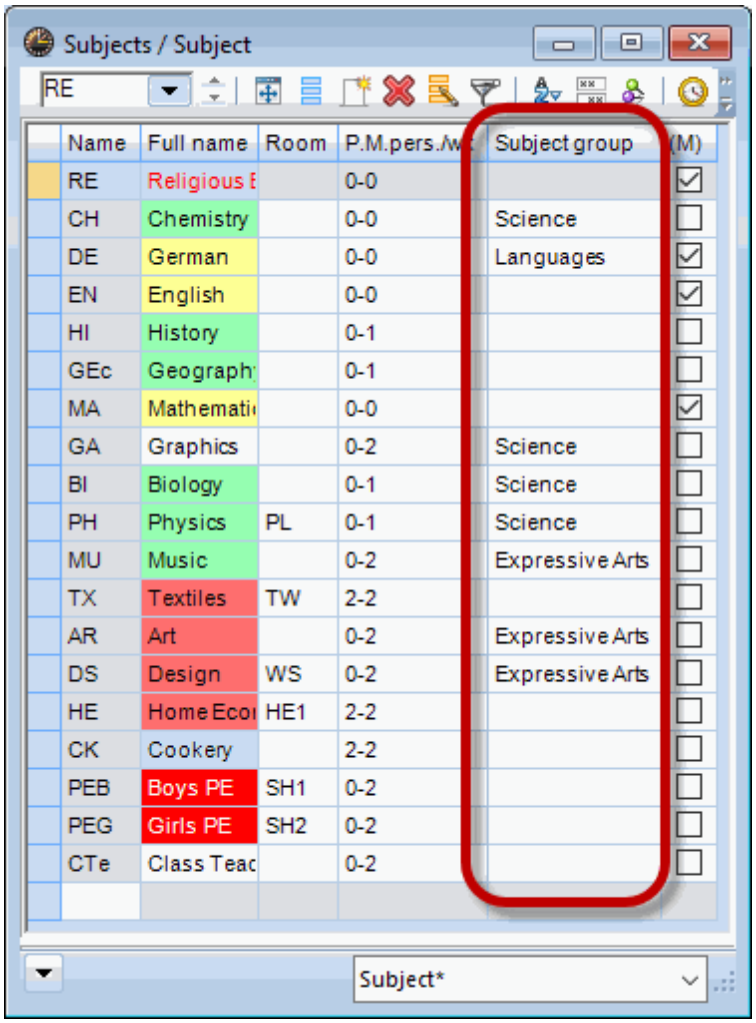
3.1.3.1.1 Subject groups

You can group subjects into subject groups under 'Master data | Subjects'.

A distinction is made between explicit and implicitsubject groups

3.1.3.1.1.1 Explicit subject group

An **explicit subject group** can be defined under 'Subjects | Master Data' by entering a group designation for all those subjects that you wish to group together. For example, in the Demo2.gpn file, subjects 'Ch' and 'Ph' have been assigned to subject group 'Science'.



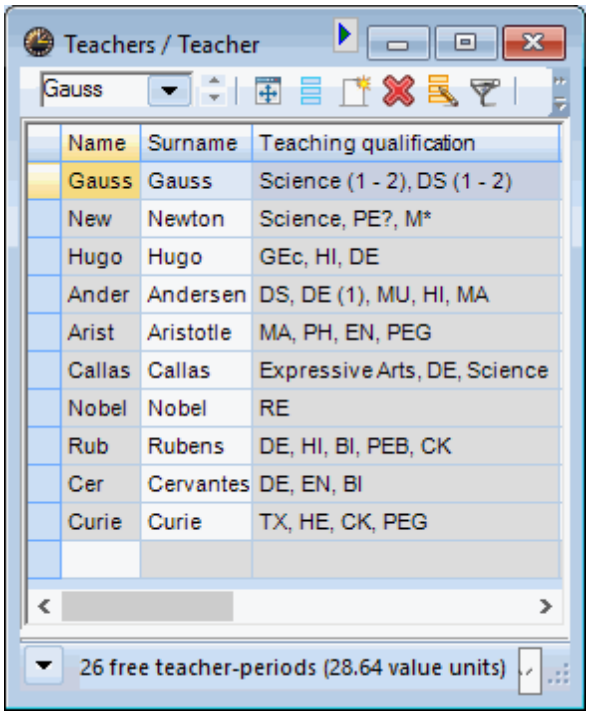
3.1.3.1.1.2 Implicit subject group

An **implicit subject group** is one where the subject description entered in the teaching qualification contains the wildcards '?' or '*'.

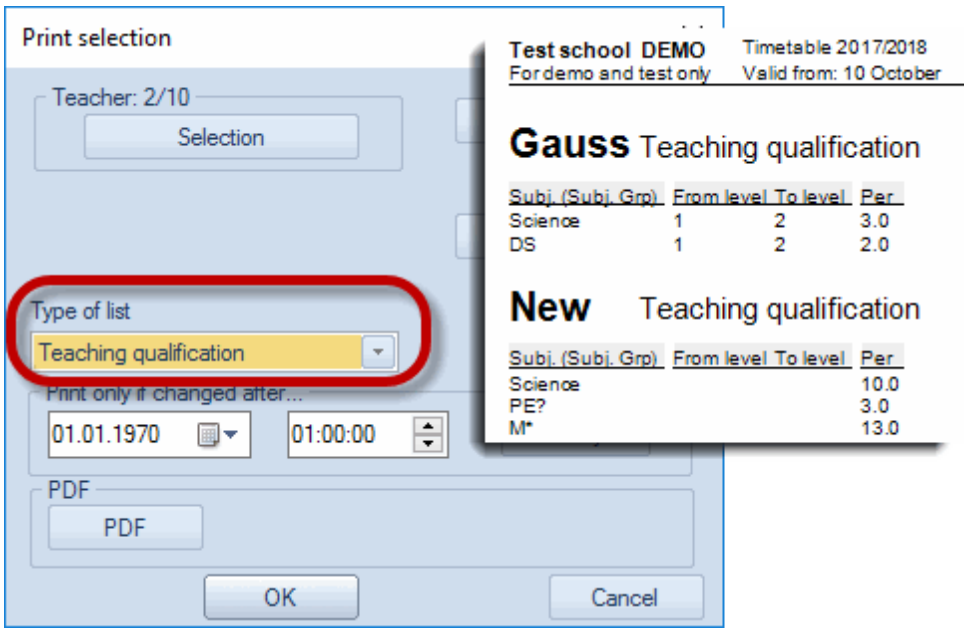
The wildcard '?' replaces an individual character while '*' stands for any character string. 'GE?', for example, could stand for GER (German) as well as for GEO (Geography) but not for the subject GRK (Greek). In contrast, "G*" would refer to all three subjects.

3.1.3.1.2 Displaying teaching qualifications

In the master data of the teachers the "Teach. qual.' column can be displayed:



If you want to also see the number of the weekly periods of every individual subject, open the master data window of the teachers and click on <Print> in the quick access toolbar. The print selection dialogue will open up and there you select 'Teacher qualification' as type of list.
By clicking on the <Selection> button you can select those teachers whose teaching qualifications should be displayed.

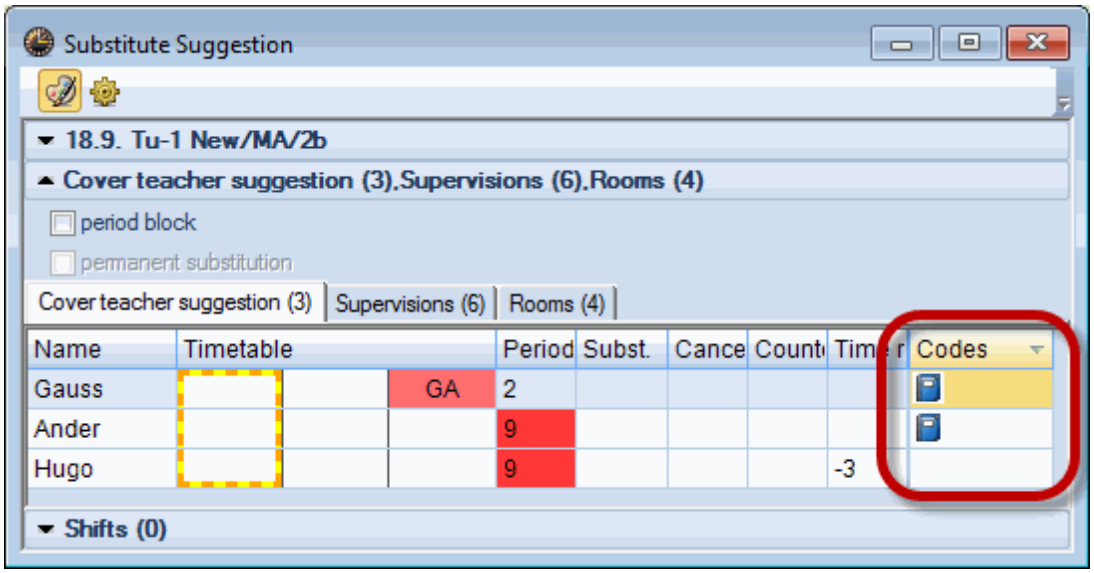


The figure above shows a list of teaching qualifications sorted by teachers. In a similar manner it is also

possible to display and print teaching qualifications sorted by subjects via 'Subjects | Master Data'.

Teacher qualifications in cover scheduling

Teacher qualification definitions also affect the 'Cover scheduling' module. A substitution suggestion contains information on whether a proposed teacher who is to cover for a colleague may teach the colleague's subject.



3.1.3.2 Change of school year

You can use the lesson planning module to perform lesson allocation when a new school year begins.

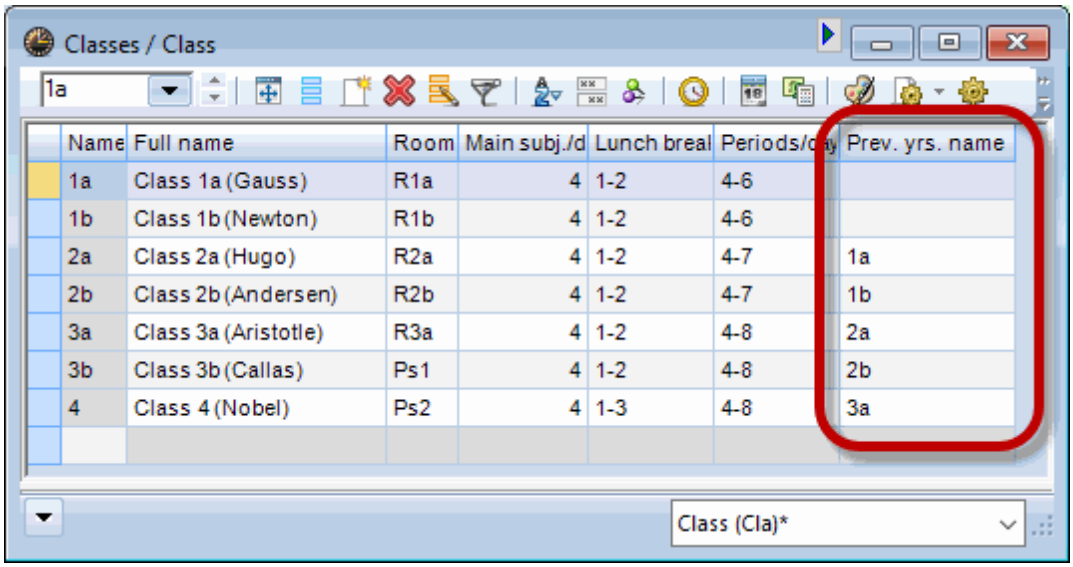
Usually a teacher will accompany a class in a certain subject over several years. If teacher Newton gave mathematics to class 2b in the previous year, he will probably teach this subject to those students again - this time in class 3b.

You can transfer the teacher into next year's class either manually with the 'Previous year's teacher' function or automatically.

3.1.3.2.1 Previous year's teacher

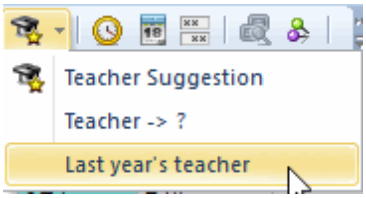
If you still have the gpn file from last year, you can allocate the previous year's teachers to a class with a few clicks.

For this, there must be a valid previous year's name entered in the master data for all classes. For example, in the figure below class 2a was class 1a last year.

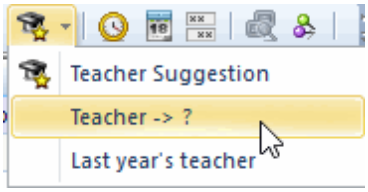


If previous year's names are entered, toolbar icon <Last year's teacher> will be active in class lessons under 'Classes | Lessons'. This results in every open lesson - i.e. every lesson where the ? teacher appears - being allocated the teacher who taught that subject to the previous year's class.

Please note that it is not the lessons as a whole that are copied from one class to another. It is only the previous year's teachers that are copied - the other lesson data for the class remain unchanged.



Function <Delete teachers> deletes the entries in the 'Teacher' column only for the currently displayed lessons and for **no other** lessons.

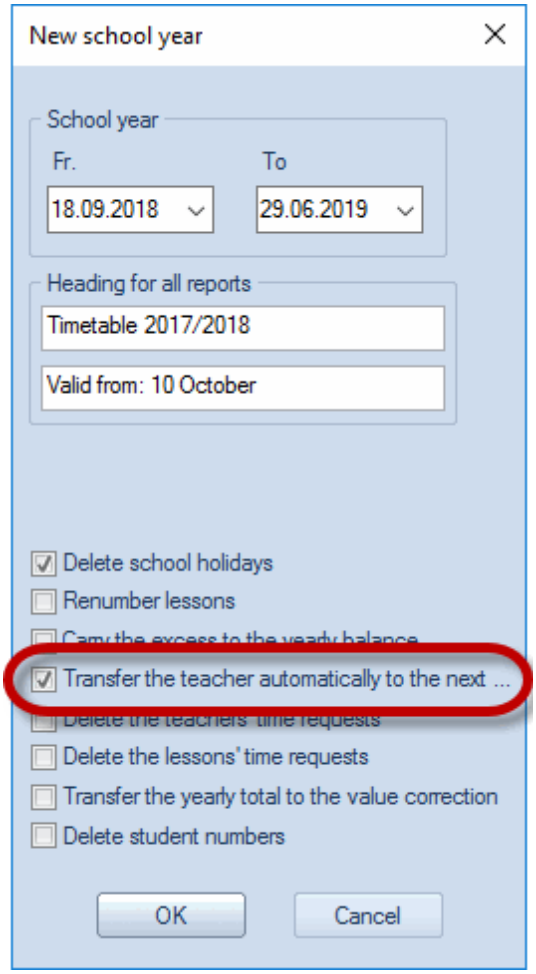


Warning:
When transferring teachers from the previous year the order in which you process the classes is important. You must begin with the senior classes and work your way back. Click first in the most senior class on <Delete teachers> and then on <Last year's teacher>. Then repeat this step for the next class down, and so on.

3.1.3.2.2 Transfer automatically

The prerequisite for transferring a teacher (accompanying a class over several years) is an entry in field ' Previous year's name ' in the master data for classes in order to determine which class forms the basis for the transfer. This transfer can be performed automatically at the change of the school year.

Access 'File | New school year ...' and check option 'Transfer teacher automatically'.



3.1.3.3 Manual teacher assignment

Allocating teaching tasks (subject allocation, teaching load), i.e. who should teach what subjects to which classes, is the most fundamental requirement of a timetable. Entering the lessons is the basis that determines whether the schedule puzzle can be 'solved' or whether difficult or insurmountable scheduling problems will occur.

You can modify and process all the data that you enter in Untis at any time. The application will frequently offer support by pointing out problems or displaying possible alternatives.

There are a number of such support functions for the allocation of subjects; these are described below.

Subject bottlenecks

Teacher suggestion

Lesson proposal

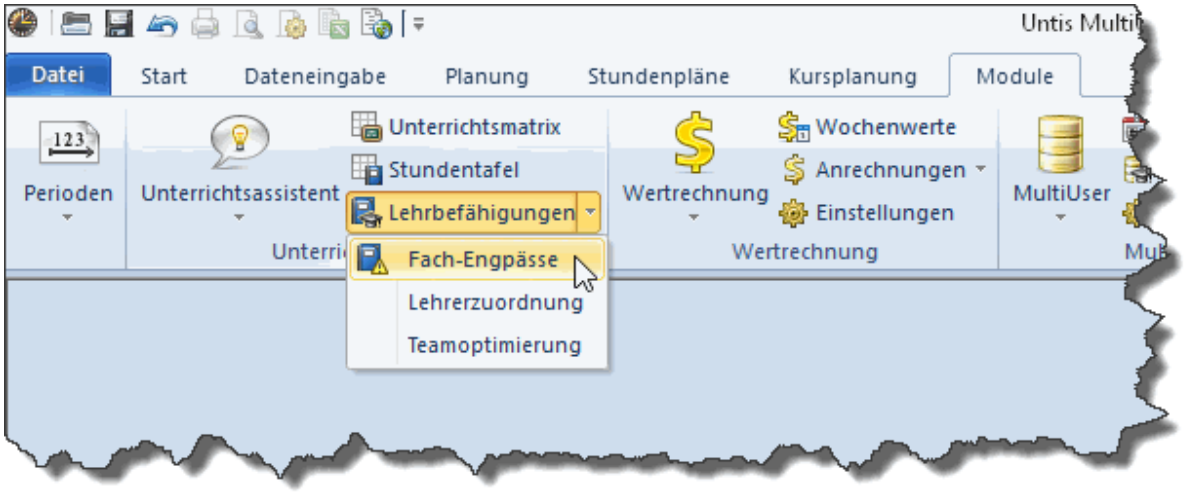
3.1.3.3.1 Subject bottlenecks

Problems can arise if not enough qualified teachers are available to teach certain subjects. Calculating subject bottlenecks makes sense when teachers are qualified to teach more than one subject, which is usually the case.

Let us assume that teacher Gauss is qualified to teach mathematics and physics. His school has quite a few maths teachers but only a few physics teachers. If teacher Gauss has already been allocated so many maths lessons that he has met his target number of periods there could be a bottleneck in physics as there are not so many qualified teachers.

In this case it would make sense to allocate teacher Gauss fewer maths and more physics lessons in exchange.

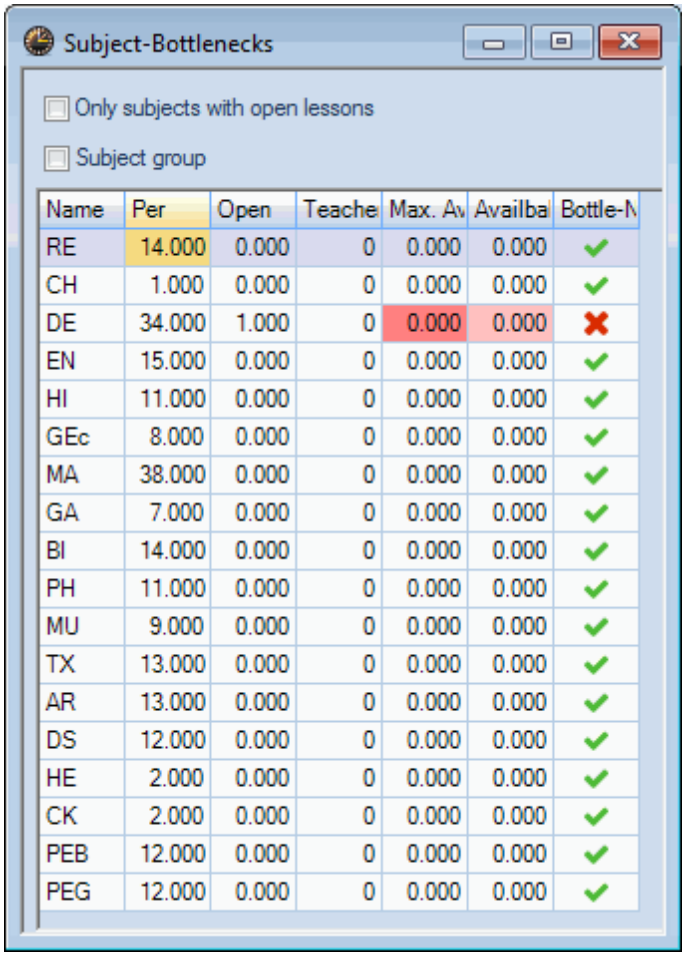
The 'Subject Bottlenecks' function can be found on the 'Modules' tab, section 'Lesson Planning', 'Teaching qualifications' icon.



this function is used to determine and display the following data for each subject:

- Name: Short name of the subject
- Per: Number of periods that the subject should be taught - for the whole school.
- Open: Number of periods that have no teacher entered - again for the whole school.
- Teachers: Number of teachers for whom a qualification for this subject has been entered.
- Max. available: The total number of vacant periods of all teachers with the qualification for the subject in question. 'Vacant' here means the number of periods that are missing to make up a teacher's target contractual hours.
- Available: This column displays the available periods of the qualified teachers distributed over the open lessons of those subjects for which they are qualified.

- Bottleneck . (Bottleneck index): This column displays a number between 0 (green tick) and 999 (red X), with 0 indicating that there are no bottlenecks in the scheduling of this subject while 999 indicates that the number of available periods of the subject concerned is less than or equal to the number of vacant periods. In this case the available periods in the relevant subjects are highlighted in red. The greater the bottleneck index the tighter the situation is for this subject. It might still be feasible with the available periods, but it makes sense to schedule those subjects with a higher bottleneck index.



Name	Per	Open	Teache	Max. Av	Availba	Bottle-N
RE	14.000	0.000	0	0.000	0.000	✓
CH	1.000	0.000	0	0.000	0.000	✓
DE	34.000	1.000	0	0.000	0.000	✗
EN	15.000	0.000	0	0.000	0.000	✓
HI	11.000	0.000	0	0.000	0.000	✓
GEc	8.000	0.000	0	0.000	0.000	✓
MA	38.000	0.000	0	0.000	0.000	✓
GA	7.000	0.000	0	0.000	0.000	✓
BI	14.000	0.000	0	0.000	0.000	✓
PH	11.000	0.000	0	0.000	0.000	✓
MU	9.000	0.000	0	0.000	0.000	✓
TX	13.000	0.000	0	0.000	0.000	✓
AR	13.000	0.000	0	0.000	0.000	✓
DS	12.000	0.000	0	0.000	0.000	✓
HE	2.000	0.000	0	0.000	0.000	✓
CK	2.000	0.000	0	0.000	0.000	✓
PEB	12.000	0.000	0	0.000	0.000	✓
PEG	12.000	0.000	0	0.000	0.000	✓

Checking selection box 'Only subjects with open lessons' results in only those subjects being displayed for which teachers must still be found.

Checking selection box 'Subject group' results in the subject groups rather than the subjects being displayed.

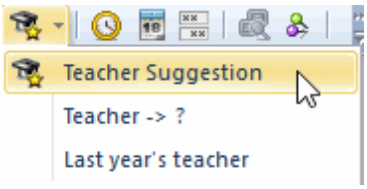
The list of subject bottlenecks can be printed out by clicking the <Print> button.

3.1.3.3.2 Teacher suggestion

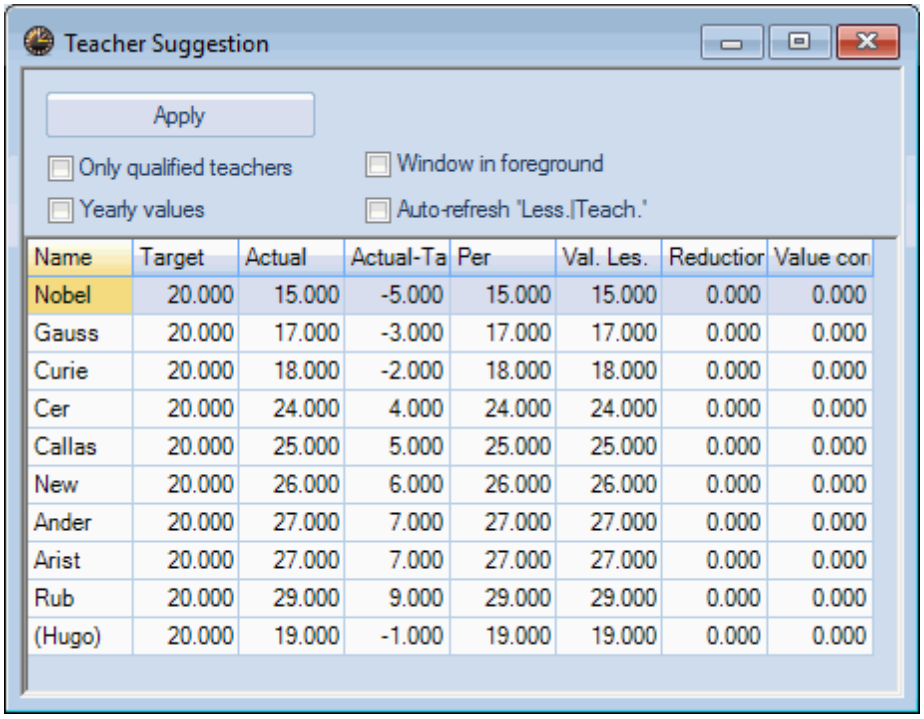
If you are not sure which teacher is the most suitable for a certain lesson when you are entering data you can enter a ? as wildcard teacher instead of a normal teacher's name. The <Teacher suggestion> function will help you to find a suitable teacher later.

You can of course use this function to search for alternative teachers for lessons that have already been scheduled.

The teacher suggestion function is invoked by clicking the corresponding icon in a lesson window (e.g. 'Classes | Lessons') and is performed for the lesson that you click on with the mouse.



Additionally there are four fields available to make a selection:



Name	Target	Actual	Actual-Ta	Per	Val. Les.	Reductior	Value cor
Nobel	20.000	15.000	-5.000	15.000	15.000	0.000	0.000
Gauss	20.000	17.000	-3.000	17.000	17.000	0.000	0.000
Curie	20.000	18.000	-2.000	18.000	18.000	0.000	0.000
Cer	20.000	24.000	4.000	24.000	24.000	0.000	0.000
Callas	20.000	25.000	5.000	25.000	25.000	0.000	0.000
New	20.000	26.000	6.000	26.000	26.000	0.000	0.000
Ander	20.000	27.000	7.000	27.000	27.000	0.000	0.000
Arist	20.000	27.000	7.000	27.000	27.000	0.000	0.000
Rub	20.000	29.000	9.000	29.000	29.000	0.000	0.000
(Hugo)	20.000	19.000	-1.000	19.000	19.000	0.000	0.000

- **Only qualified teach.** : Checking this box results in only those teachers being included in the selection who are qualified to teach the subject in question.
- **Yearly values** : Use this box to determine whether weekly or yearly values should be displayed in the 'Plan', 'Actual' and 'Actual-planned' columns.
  Window in foreground Checking this box results in teacher suggestions always being displayed in the foreground.
- **Auto-refresh les. teach.** : If this box is checked you only need to click on a suggested teacher once to display the selected teacher in the lesson window as well.

Warning:
Please bear in mind that in the case of multi-teacher couplings, teaching teams have a direct effect on

how lessons are scheduled.

Let us assume that teacher Curie belongs to two teams of teachers. She teaches design together with teacher Gauss and sport with teacher Newton.

For example, as soon as all sports lessons a have been scheduled this constellation results in the period for design being blocked. If teacher Newton also belongs to a further team of teachers, its lessons are also blocked.

This means that chains of conflict can arise that lead to a large number of non-scheduled periods. (Please refer to the sections on' CCC analysis ' and ' Teaching teams ' in the user manual for more information.)

For this reason the suggested teachers are displayed on a coloured background.

- **Green** means that the teacher already teaches in this team.
- **White** means that allocating this teacher would lead to the creation of a new team of teachers but that the suggested teacher still teaches fewer than nine periods in teaching teams.
- **Red** signifies those teachers who already teach nine periods or more in couplings with other teams.

Tip: Substitute ?-teacher
With the lessons view for teachers you can easily and systematically process all open teacher entries. Select the ?-teacher under 'Lessons | Teachers' and insert suitable teachers into the lessons row by row with the help of the teacher suggestion feature. The processed lessons disappear from the ?-teacher overview and are placed under the assigned teacher.

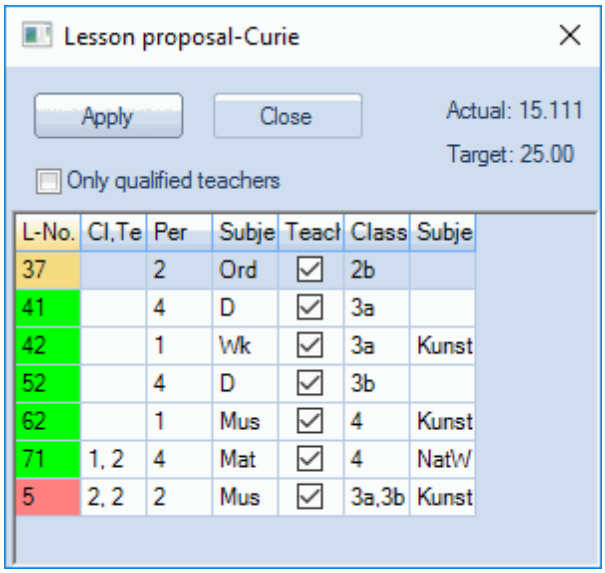
3.1.3.3.3 Lesson proposal

This function can be seen as the equivalent of the teacher suggestion for lessons

Untis can propose suitable lessons for teachers who do not have sufficient periods in order to meet their contractual teaching commitment. Select toolbar icon <Lesson proposal> under 'Teachers | Lessons'. A list of lessons will be displayed for which no teachers have been entered so far (? teachers).

The lesson proposal can be displayed taking into account the teaching qualification and - if you use the department timetable module - the departments.

The lessons displayed are either on a green, white or red background.



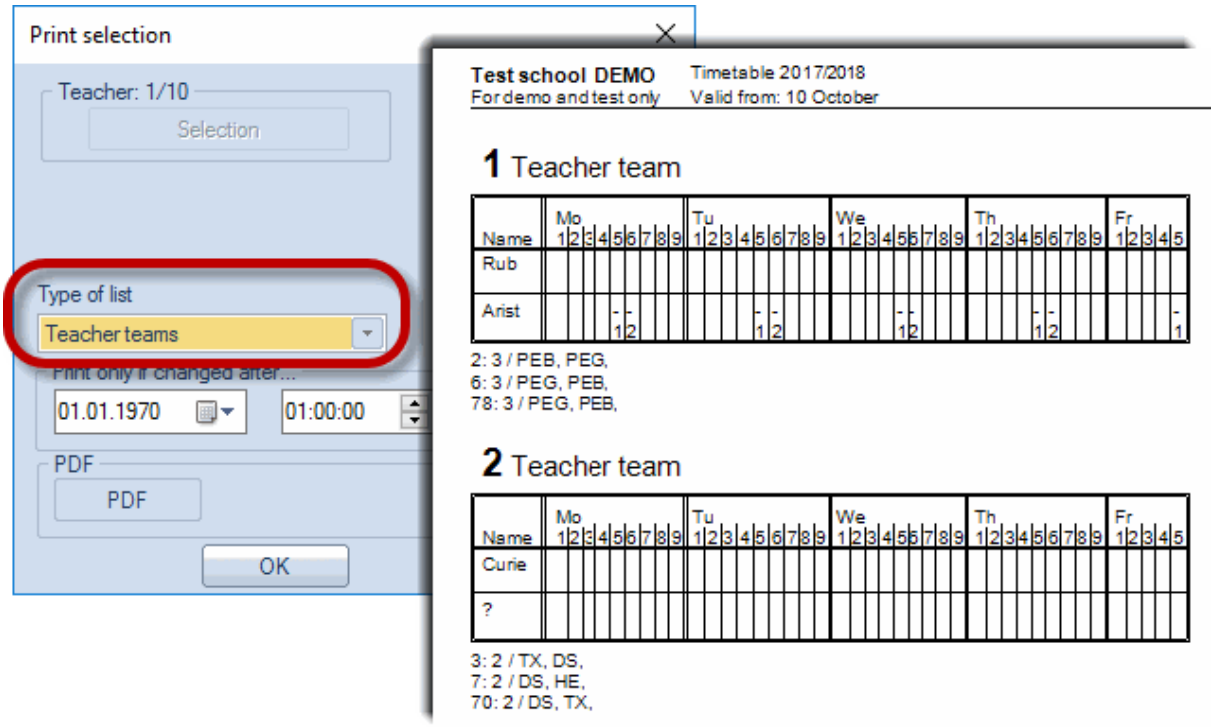
- **Green** denotes lessons that, when this teacher is allocated, do not cause a new teaching team to be created. This means lessons without teacher coupling or lessons with teachers who already form a teaching team with the current teacher.
- **White** denotes lessons that when allocated lead to the creation of a new teaching team, but where the teacher is not active in the team for more than eight periods.
- **Red** denotes lessons that, when allocated, lead to the creation of a new teaching team with the teacher already being active in teaching teams for nine or more periods. Allocating this lesson would lead to constraints on the optimisation of the timetable.

The figure above shows the lesson proposals for teacher Curie from the Demo2.gpn file. All lessons are displayed with a green background - except for the last one. There is no coupling for the first five lessons in the list - she would take the sixth (L-No 71) with teacher Gauss. As she already takes lesson number 48 with the same teacher (as you can see e.g. from the list of teaching teams lower down) there would be no new teaching team created; for this reason the lesson has a green background.

The last lesson in the list - No. 5 - has a red background. One of the two coupling teachers is teacher Callas with whom teacher Curie does not take any common lessons. Selecting this lesson would lead to the creation of a new team.

Teacher teams

You can print or display the teaching teams from the open teacher master data window by selecting <Print> or <Print preview>, list type 'Teaching teams'. This list also contains the time requests of the teachers concerned.



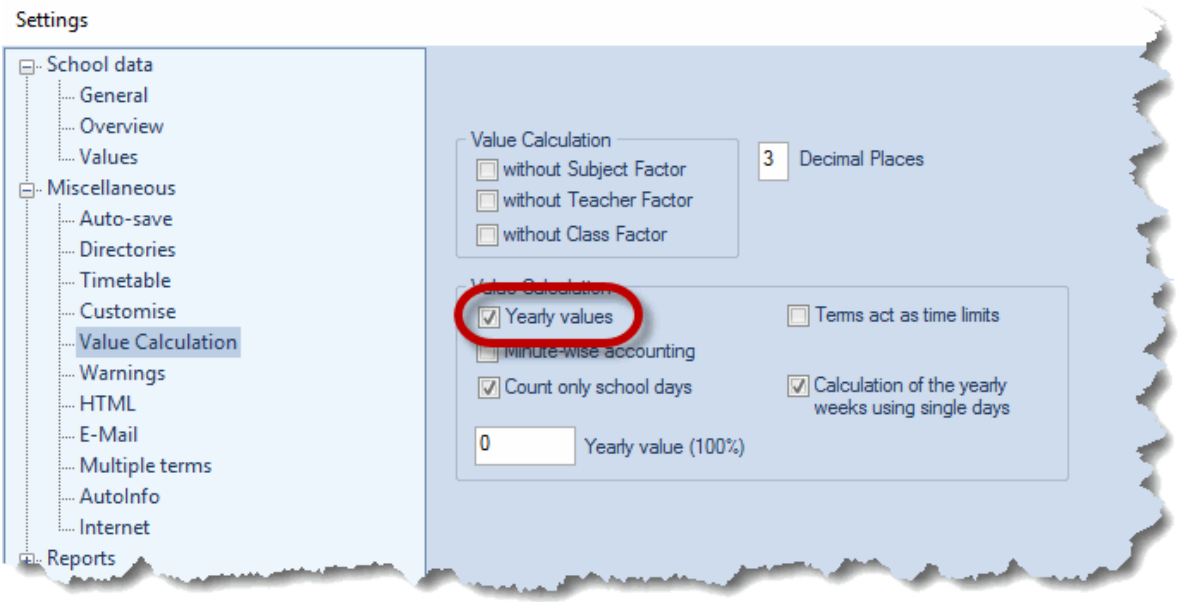
3.1.4 Teacher's yearly work

With the teacher's yearly work model, as the name suggests, the teacher's workload applies to the year as a whole and not as usual to one week. The following values can contribute to the yearly workload:

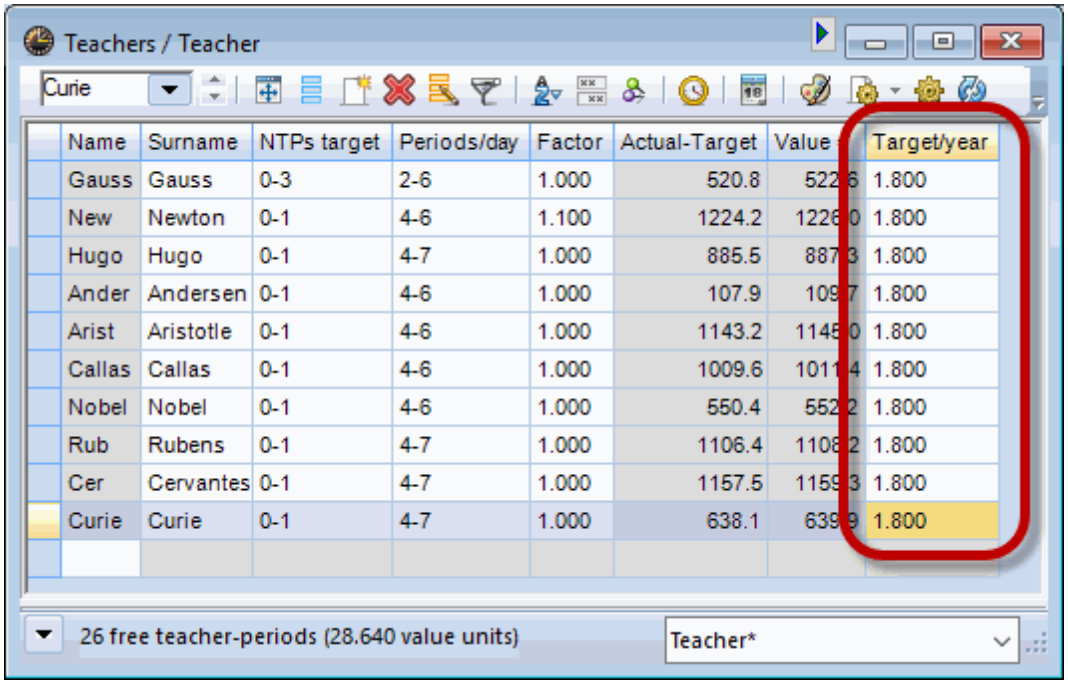
Lessons according to the timetable
Reductions , which can be classified as follows:

- Reductions resulting from lessons held such as preparation, follow-up work, corrections etc.
- Reductions that depend on the teacher's yearly target workload such as further training
- Miscellaneous reductions such as timetable scheduling, theatre group supervision etc.

Option 'Yearly values' on the 'Value calculation' tab under 'Start | Settings | Miscellaneous' must be checked. This causes the tab 'Yearly work' to be displayed in the teacher master data.

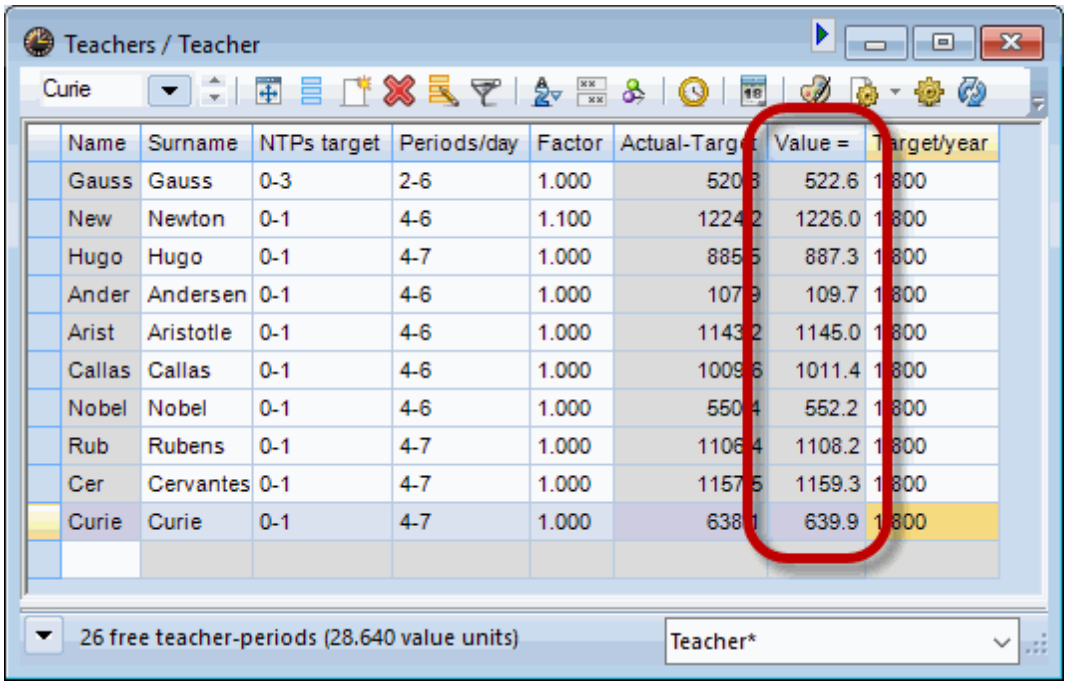


In addition, a value should be entered for every teacher in the 'Plan/year' field on the 'Values' tab under 'Teachers | Master data'.



3.1.4.1 Lessons according to timetable

The yearly lessons according to timetable are calculated automatically and displayed in the 'Value' field of the 'Teachers | Lessons' window.



3.1.4.2 Reductions for yearly work

When using the yearly work model a difference can be made between three types of reduction:

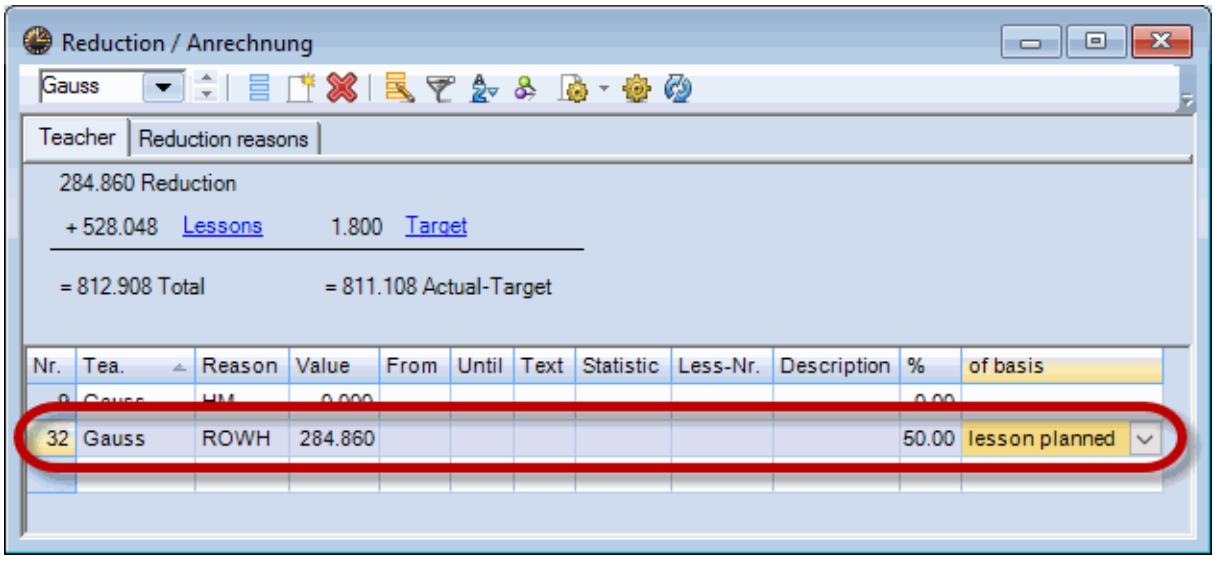
- Reductions resulting from lessons held
- Reductions that depend on the teacher's yearly target workload
- Miscellaneous reductions

3.1.4.2.1 Reductions resulting from lessons held

Some additional duties depend on the extent of the lessons held, e.g. corrections, preparation, follow-up work etc.

Definitions are made as follows:

- Open the reductions window by selecting 'Modules | Value calculation | Reductions'.
- Select the option 'Lesson planned' in the 'from basis' column.
- Specify a percentage for this reduction in the '%' column.



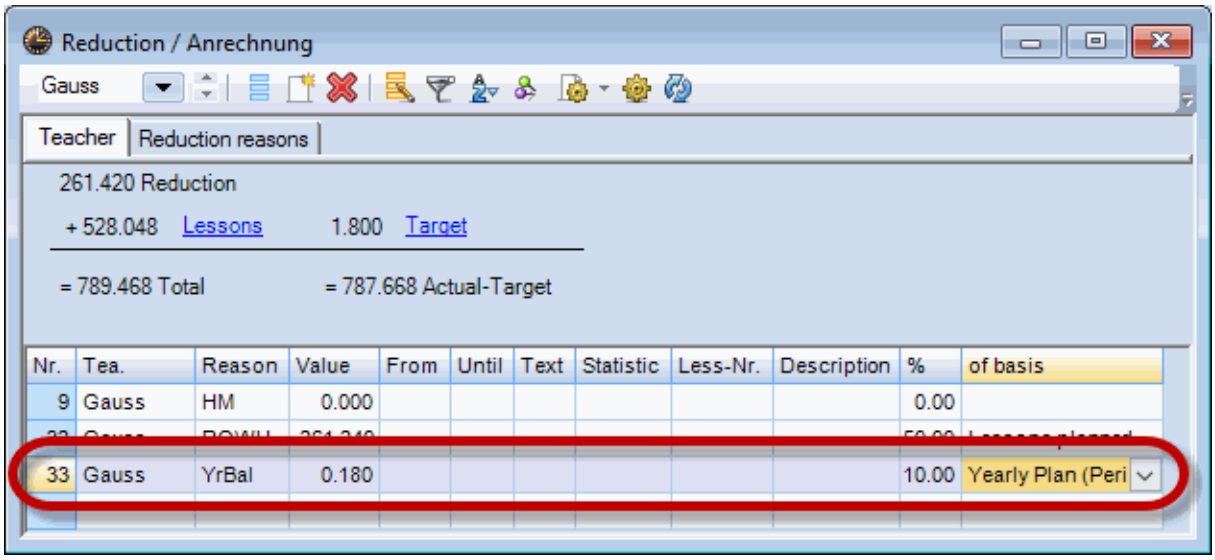
In this example teacher Gauss is given a lesson overhead corresponding to 50% of the scheduled teaching time.

3.1.4.2.2 Reductions from yearly target workload

Many additional duties depend on the scale of the teacher's target workload such as further training.

Definitions are made as follows:

- Open the reductions window by selecting 'Modules | Value calculation | Reductions'.
- Select the option 'Yearly target' in the 'from basis' column.
- Specify a percentage for this reduction in the '%' column.



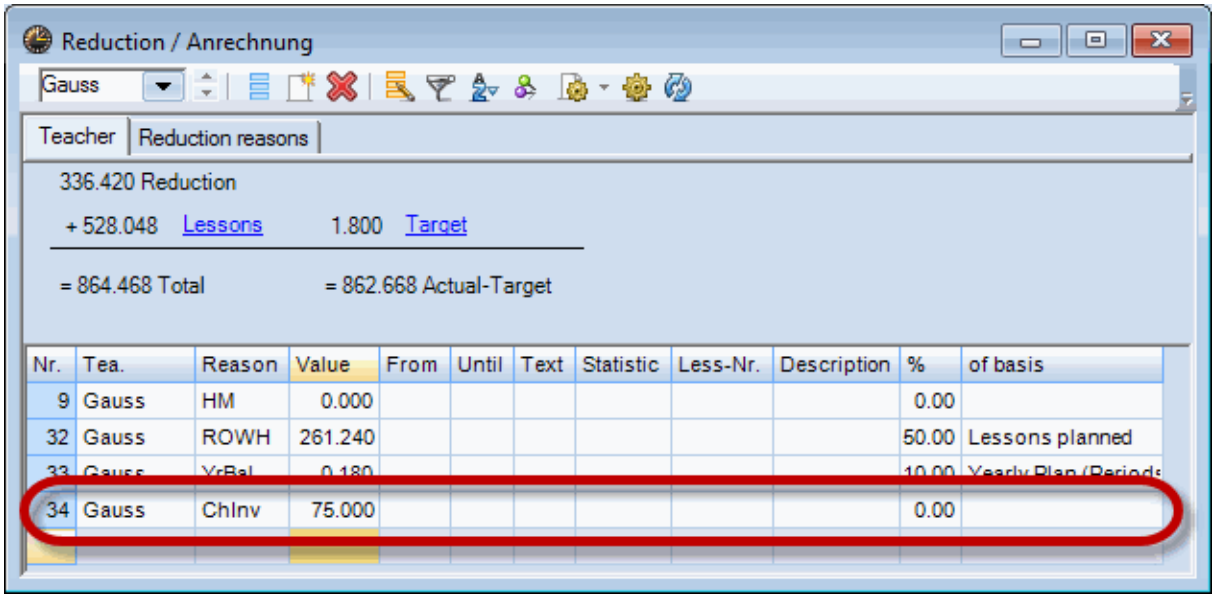
In this example teacher Gauss is given a further training (FT) reduction corresponding to 10% of the yearly target.

3.1.4.2.3 Miscellaneous reductions

Some reductions do not depend on scheduled lessons or on the yearly target. They are specified as a fixed value.

Definitions are made as follows:

- Open the reductions window by selecting 'Modules | Value calculation | Reductions'.
- Enter an absolute value for this reduction in the 'Value' column

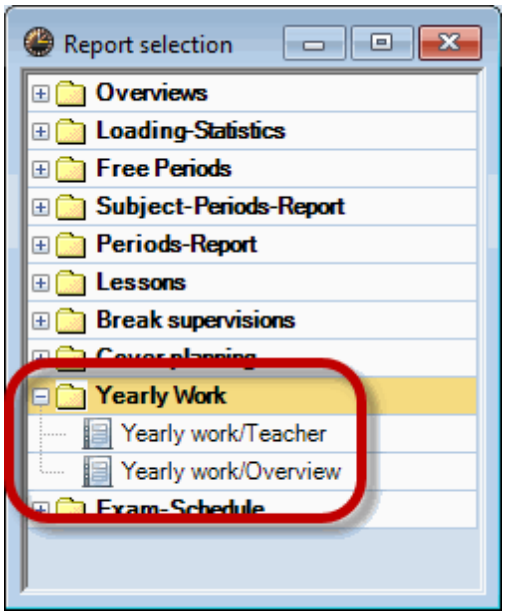


In this example teacher Gauss is given a reduction for supervising chemistry equipment (ChS) corresponding to 75 value units.

3.1.4.3 Reporting yearly work

Reporting yearly work There are two reports available to output yearly work and these can be accessed via 'Reports' on the 'Start' tab.

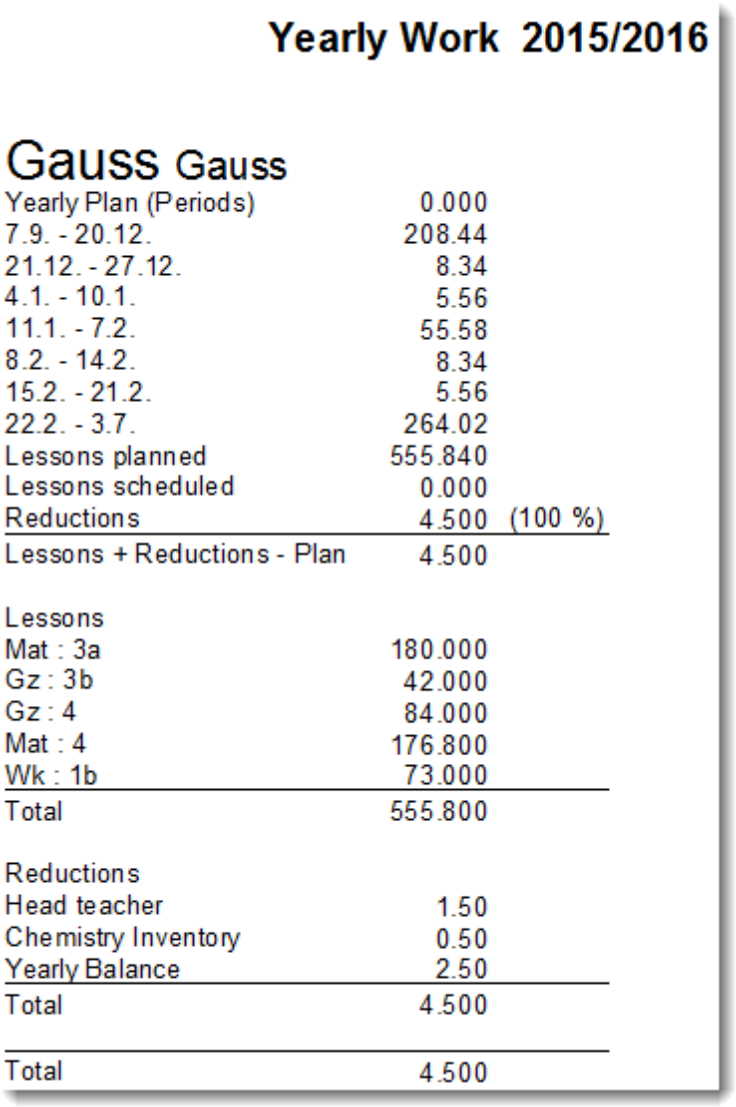
- Yearly work / Teachers
- Yearly work / Overview



3.1.4.3.1 Yearly work / teachers

The 'Yearly work / teachers' report displays the values for the yearly target plan, the lessons, the reductions and the resulting value showing whether teachers are working too many or too few hours.

The print selection dialogue allows you to select whether a detailed list of reductions and a list sorted by lessons should be output.



Yearly Work 2015/2016

Gauss Gauss

Yearly Plan (Periods)	0.000	
7.9. - 20.12.	208.44	
21.12. - 27.12.	8.34	
4.1. - 10.1.	5.56	
11.1. - 7.2.	55.58	
8.2. - 14.2.	8.34	
15.2. - 21.2.	5.56	
22.2. - 3.7.	264.02	
Lessons planned	555.840	
Lessons scheduled	0.000	
Reductions	4.500	(100 %)
Lessons + Reductions - Plan	4.500	

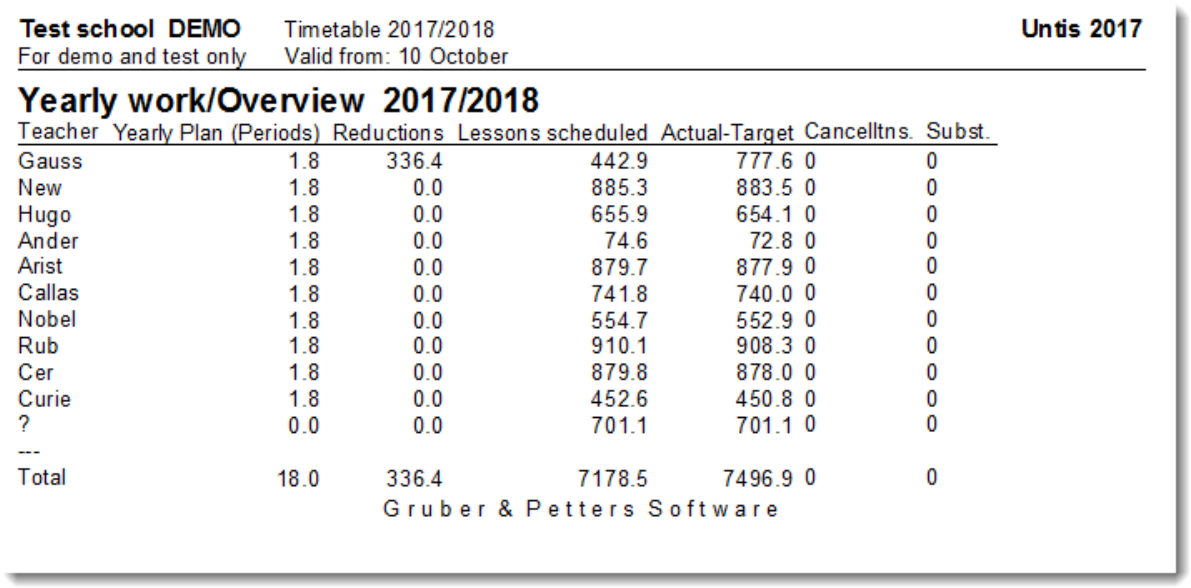
Lessons	
Mat : 3a	180.000
Gz : 3b	42.000
Gz : 4	84.000
Mat : 4	176.800
Wk : 1b	73.000
Total	555.800

Reductions	
Head teacher	1.50
Chemistry Inventory	0.50
Yearly Balance	2.50
Total	4.500

Total	4.500

3.1.4.3.2 Yearly work / overview

The 'Yearly work / Overview' report displays the values used to calculate the actual/planned values in condensed form. It also lists the number of substitutions and cancellations.



Test school DEMO Timetable 2017/2018 **Untis 2017**
For demo and test only Valid from: 10 October

Yearly work/Overview 2017/2018

Teacher	Yearly Plan (Periods)	Reductions	Lessons scheduled	Actual-Target	Cancelltns.	Subst.
Gauss	1.8	336.4	442.9	777.6	0	0
New	1.8	0.0	885.3	883.5	0	0
Hugo	1.8	0.0	655.9	654.1	0	0
Ander	1.8	0.0	74.6	72.8	0	0
Arist	1.8	0.0	879.7	877.9	0	0
Callas	1.8	0.0	741.8	740.0	0	0
Nobel	1.8	0.0	554.7	552.9	0	0
Rub	1.8	0.0	910.1	908.3	0	0
Cer	1.8	0.0	879.8	878.0	0	0
Curie	1.8	0.0	452.6	450.8	0	0
?	0.0	0.0	701.1	701.1	0	0

Total	18.0	336.4	7178.5	7496.9	0	0

Gruber & Petters Software

3.2 Scheduling tools

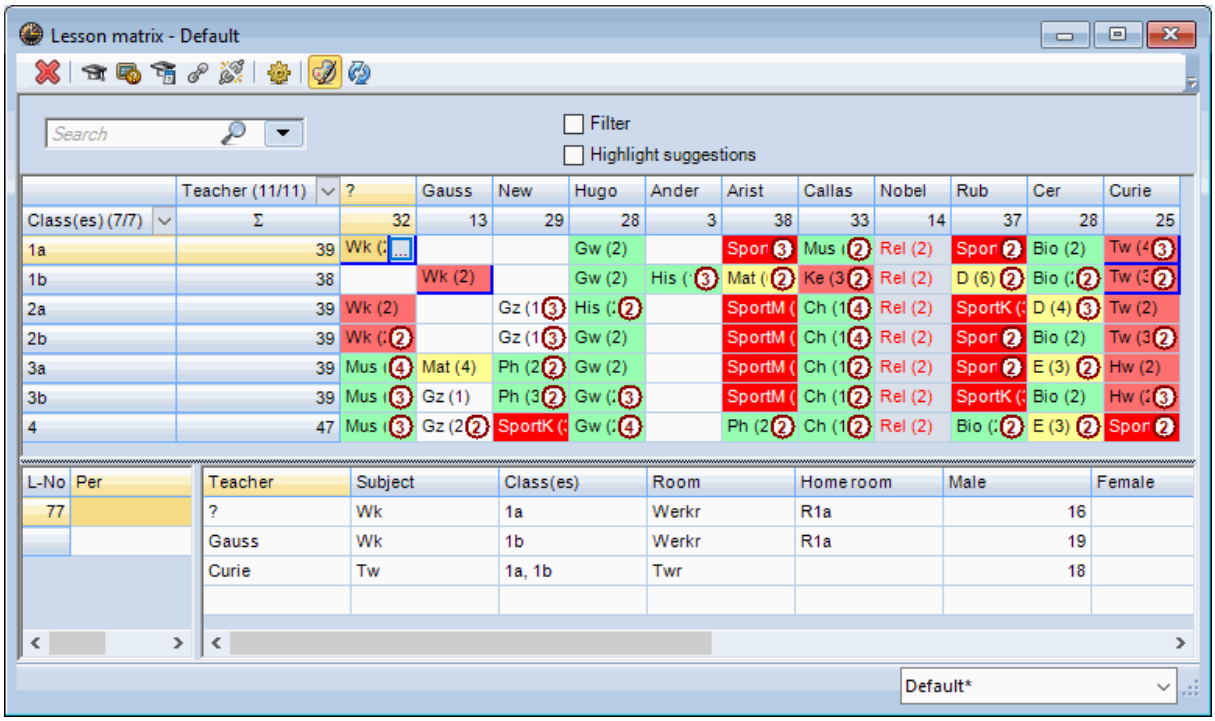
The 'Lesson planning and value calculation' module provides you with a number of additional tools for workload planning.

- Lesson matrix
- Lesson table (syllabus)
- Lesson comparison

3.2.1 Lesson matrix

The lesson matrix, which you access via menu item 'Lessons | Matrix', gives you a clear at-a-glance overview of all the lessons at your school.

The key lesson data are class, teacher and subject. The rows and columns of the matrix display two of these three master data elements while the individual cells contain the third element together with an additional item of information (either the number of weekly lessons, the lesson value or the lesson number) that you can select yourself. (How this selection is made is described later.) Colour settings from the master data are adopted in the lesson matrix.



Note: Copying to Excel
You can copy the contents of the lesson matrix to other applications such as Microsoft Excel via the Windows clipboard function by selecting the desired excerpt and using the <CTRL>+C / <CTRL>+V key combination.

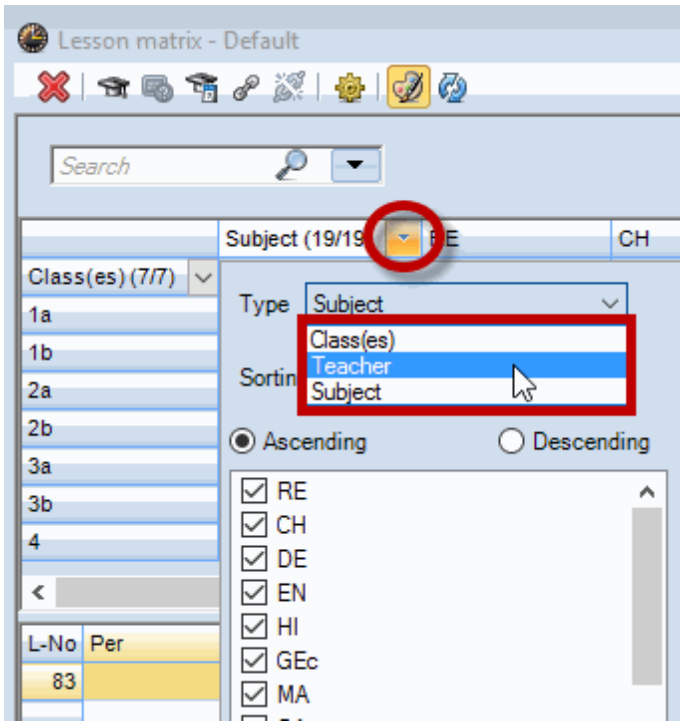
You can read more on the lesson matrix in the following chapters:

- Lesson matrix short description
- Lesson matrix settings
- Lesson matrix entries
- Further lesson matrix functions

3.2.1.1 Lesson matrix short description

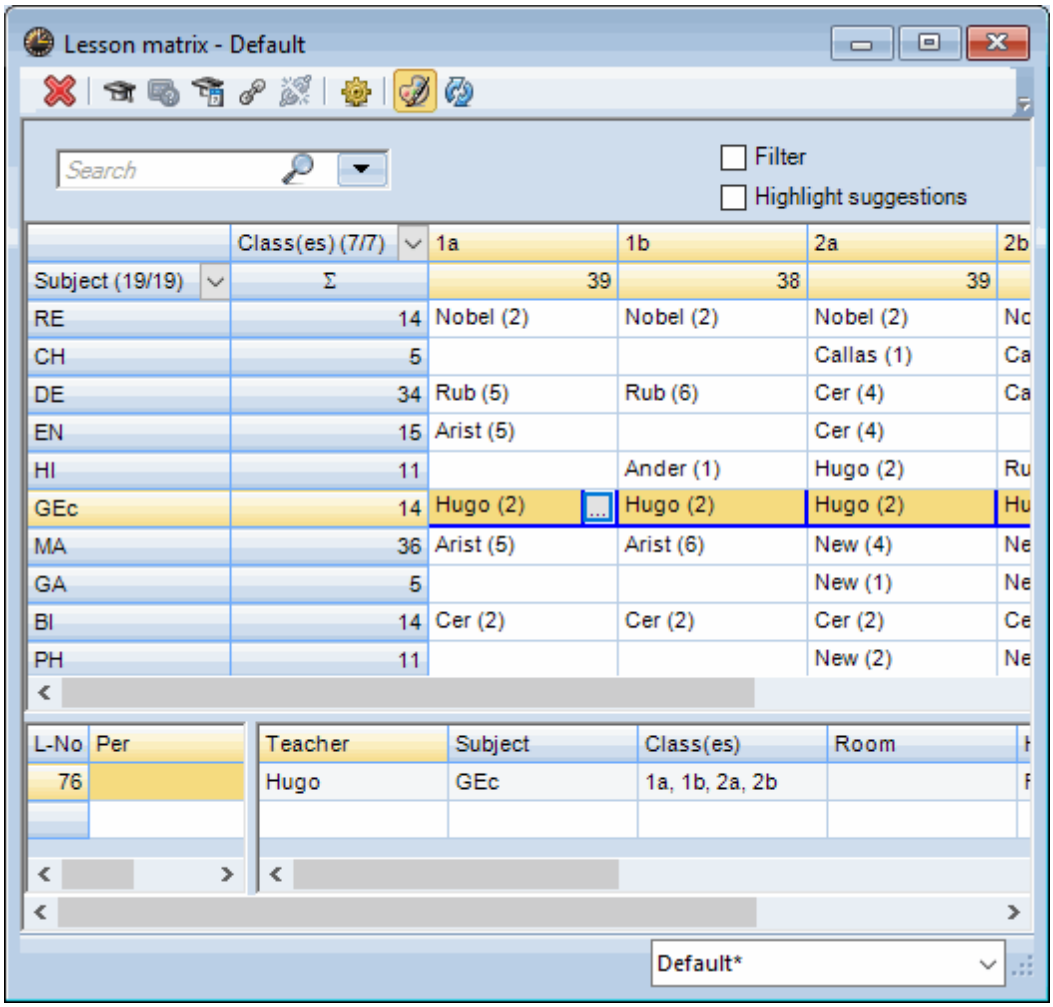
Lesson matrix short description You can follow the example below yourself using the Demo2.gpn file.

In the upper part of the window you can set which master data element you wish to display in the rows, columns and the individual cells.



n the example below, the rows indicate the subject, the columns the classes and in the cells you can find the teacher and the weekly periods. In this way it is possible to recognise at a glance that teacher Hugo has two periods of 'GEc' with classes 1a, 1b, 2b and 2b.

Clicking on a cell in the matrix displays the corresponding lesson in the details window at the bottom of the screen.



Changes can be made to the subject allocation in the details window of the lesson matrix.

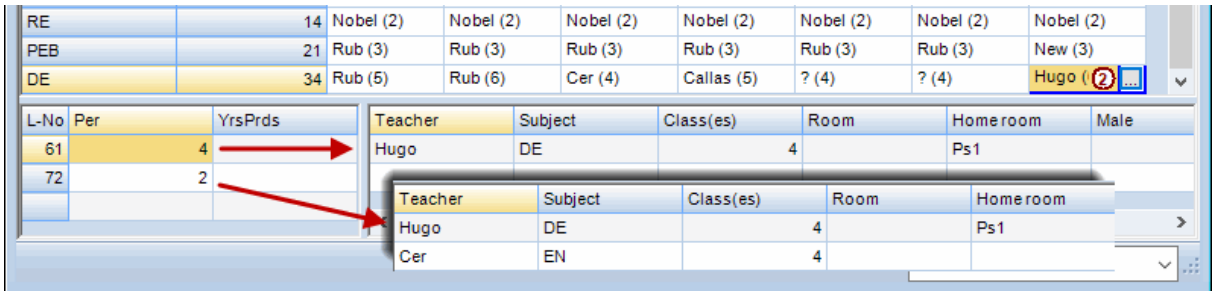
Couplings are highlighted in the lesson matrix. All those cells with elements of the coupling lesson are displayed with a blue border, as you can see in the figure with the example of teacher Hugo's geography lesson.

As in the timetable, couplings may also be marked with a full stop. To do this, click on the <Settings> button in the matrix and check the 'Mark couplings' option.

Several units forming one lesson

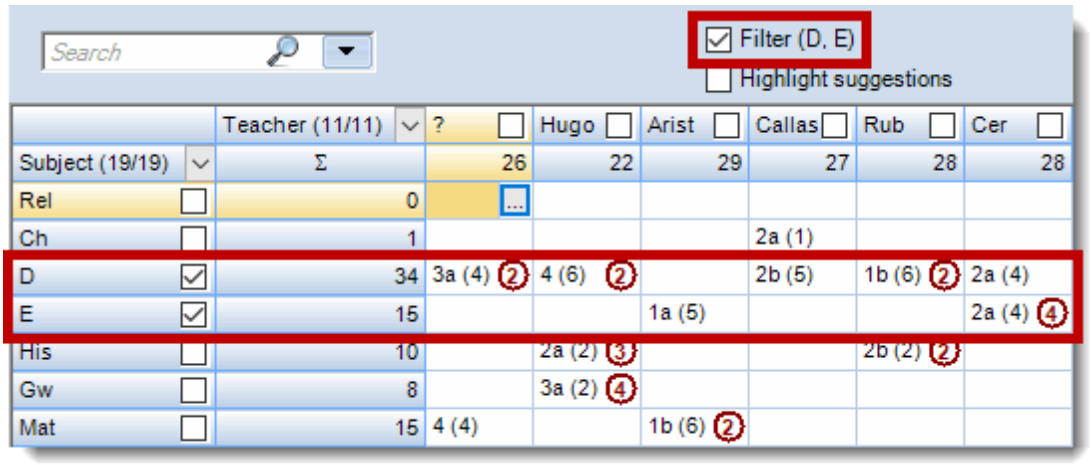
The lesson list ('L-no./per') in the upper section of the window displays the lesson number followed by the number of periods for a selected cell. If there are several entries here this means that the lesson is divided into several units. In the current example, this would be the case for teacher Hugo's German lesson in class 4. Four of the six periods are part of lesson number 61 while the remaining two are part of lesson 72.

By clicking on the relevant row in the lesson list you will see in the details window that teacher Hugo takes lesson 61 on his own while a coupling with English exists for lesson 72 with teacher Cervantes.



Filter

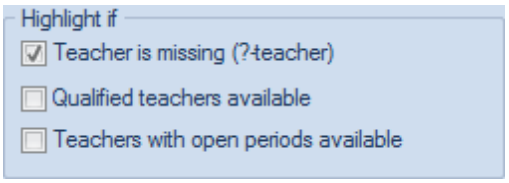
You can limit the entries in the matrix to those elements that interest you by marking one of the filter selection fields. For example, in the figure below the filter was set for the subject 'GE' (the subjects are displayed in the rows). This results in only those columns being displayed where the cell for subject 'GE' is not empty. This means that only those teachers are displayed who actually teach German.



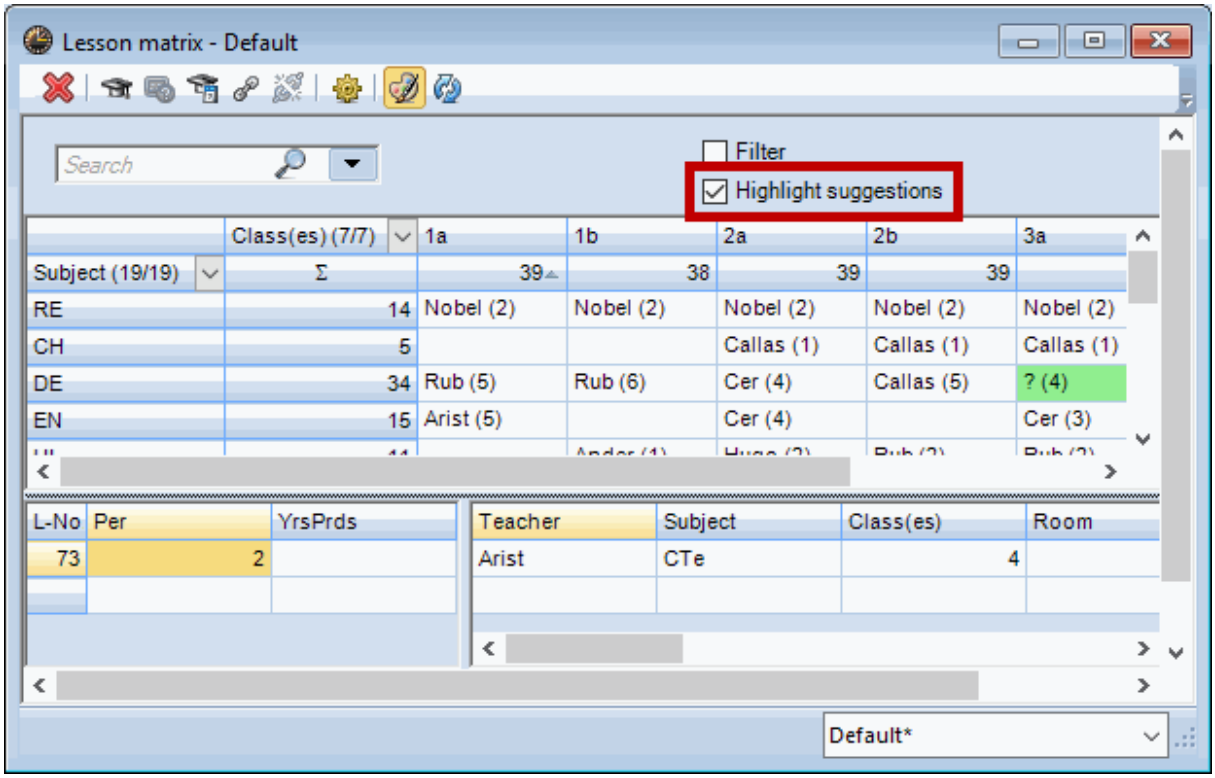
This function can of course be used in the same way for column elements. When filtering cells, the display is reduced to just those cells containing the relevant element.

Highlight suggestions

This function helps you to make special lessons visible.Under Settings of the matrix you can choose from the following options:

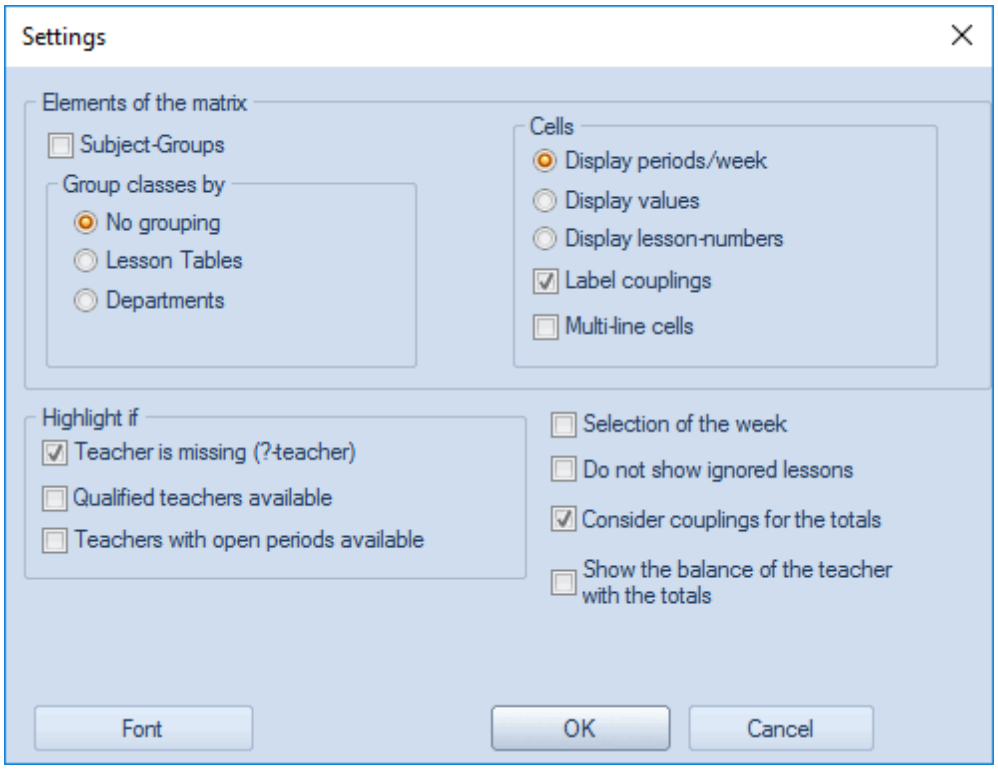


The view below shows all lessons in which ?-teacher is still active



3.2.1.2 Settings

By clicking on the <Settings> toolbar icon you open a window offering numerous display possibilities for the lesson matrix.



Elements of the matrix

Subject groups (instead of subjects): If the element type 'Subject' is in the rows or columns, subject groups can be displayed instead of subjects. If you have defined the element type 'Subject' for cells, this option will have no effect on the way in which the lesson matrix is displayed.

Group classes by

If you work with lesson tables or with the department timetable module, you can also group classes by these criteria.

Cells

You have the option to display weekly periods, value units or lesson numbers. A coupling can be indicated by a full stop.

Highlight in colour

These possibilities are described in the chapter Lesson matrix short description by using an examples.

Other setting

- **Selection of the week** : Lesson display will be limited to one week, i.e. only those lessons will be displayed that take place in the selected week. This option is only available with the multi-week timetable module.
- **Hide ignored lessons** : This option ensures that ignored lessons in the matrix are not displayed.
- **Considering couplings in totals: If you choose to display totals and also activate the selection box 'Consider couplings for the totals', periods belonging to the same coupling will only be counted once.**
- **display actual-planned balance of the teacherin the totals row: this funcition helps you to**

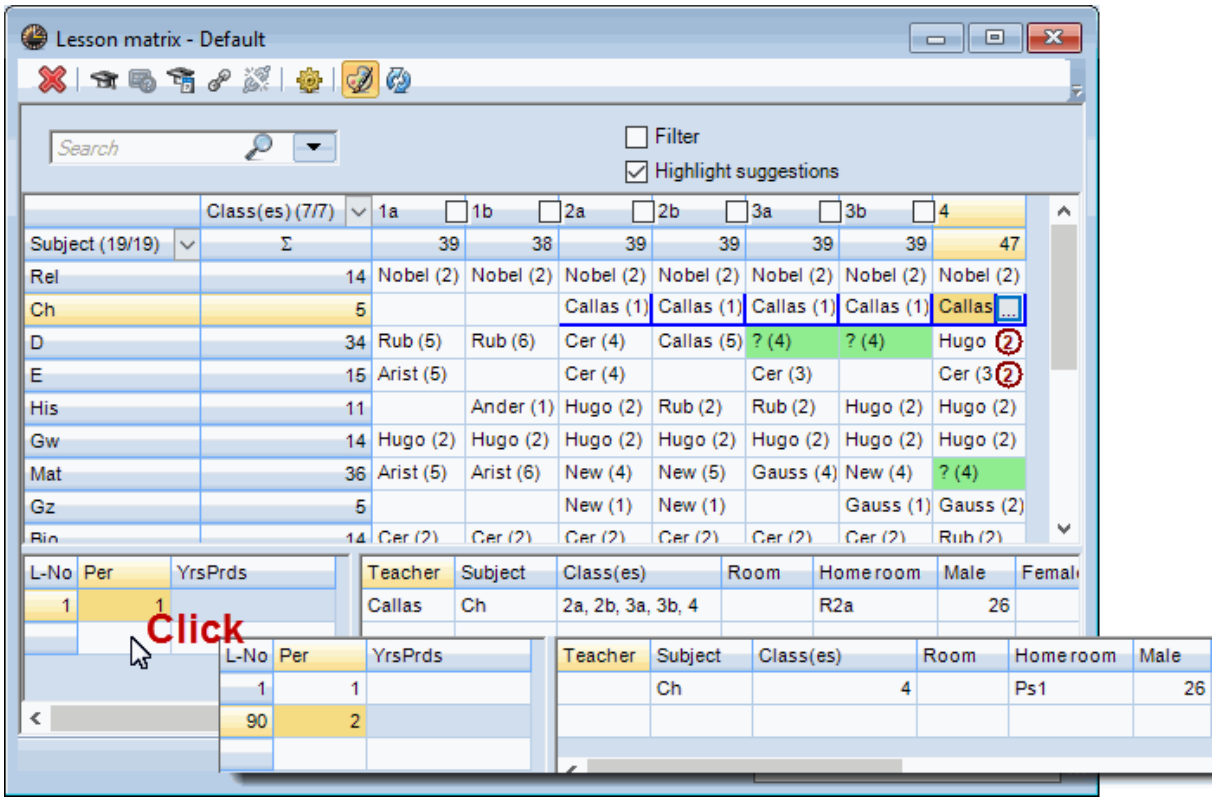
see immediately if a teacher has too much or not enough work load.

3.2.1.3 Entries in the lesson matrix

The lesson matrix is not just for display purposes; you can enter values into the individual cells. You can create, change and delete lessons.

Creating a new lesson

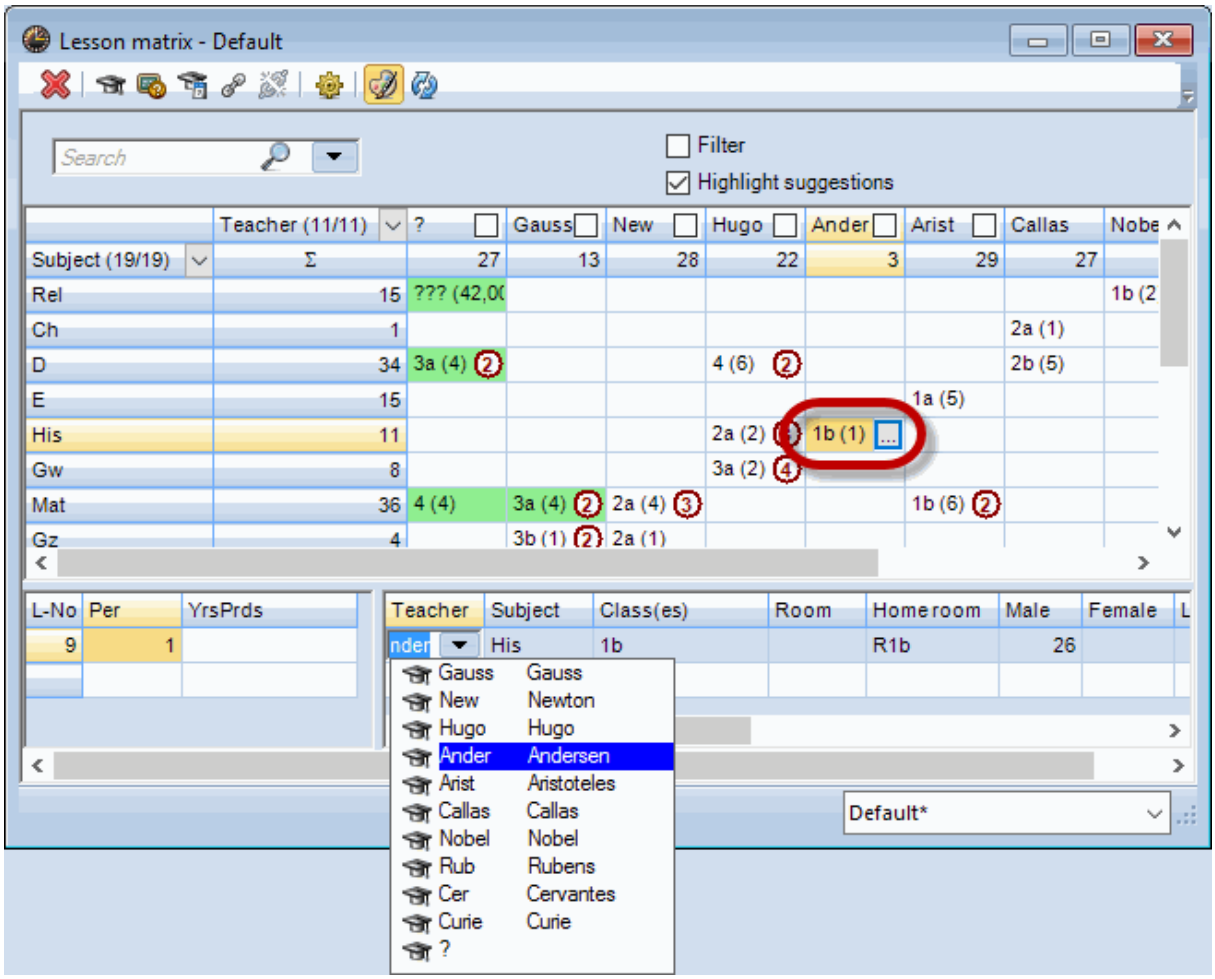
Click into the respective field of the matrix in order to create a new lesson. Enter in the left section at the bottom the weekly and the yearly periods. Now you can continue in the right section with required entries.



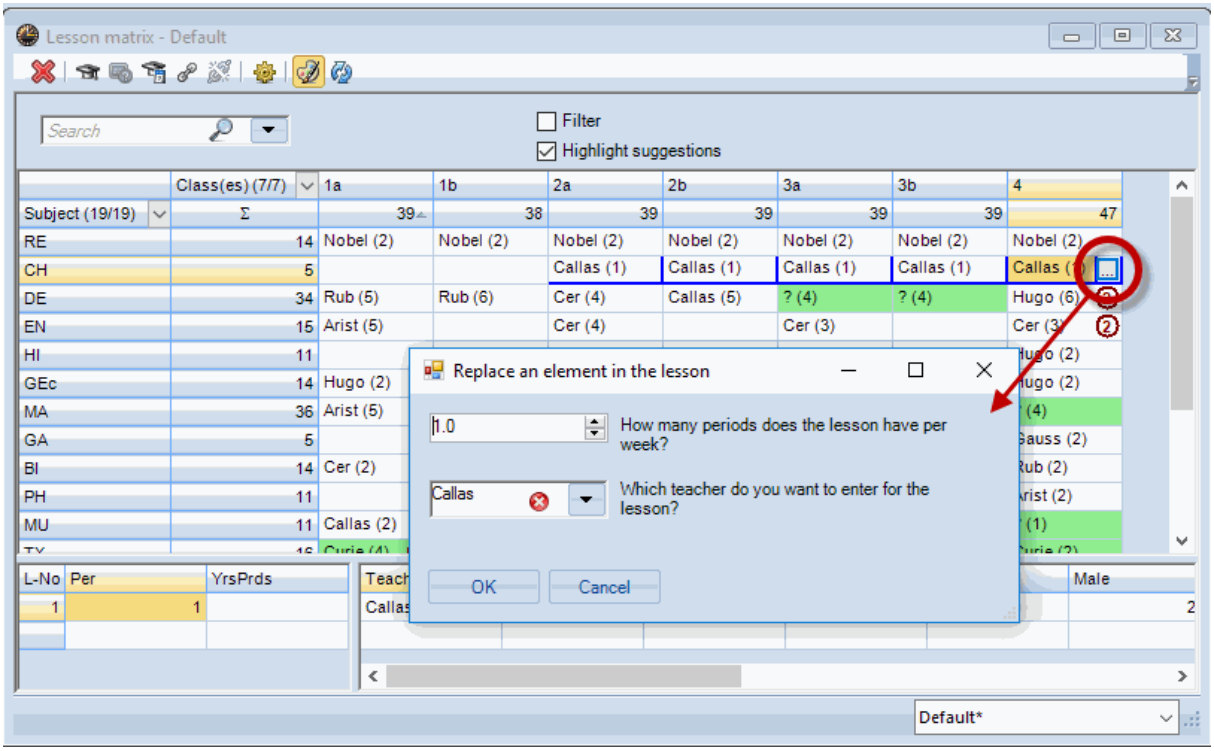
Modifying a lesson

You can modify a lesson in two different ways:

1) In the details window
In contrast to the timetable details window, you can modify in the matrix all entries you see in the details window exactly there.



2) Directly in the matrix
In the active cell of the matrix you see a little field with three dots. Click on it and a window will pop up where you can modify the lesson.



Deleting a lesson

Selecting a cell and clicking on the <Delete> button or pressing <DEL> removes the entry from the matrix and deletes the lesson.

3.2.1.4 Toolbar functions

Additional functions of the lessons matrix You will find the following icons in the lessons matrix toolbar:

Delete lessons
Use this icon to delete individual lessons from the lessons matrix. Alternatively you can press <DEL> on your keyboard..

Teacher suggestion
This function suggests a suitable teacher for the current lesson. Please refer to chapter ' Teacher suggestion ' for a more detailed description.

Last year's teacher
If the class is displayed in the columns/rows of the matrix, you can use this function to assign the previous year's teacher(s) to all lessons of the class that you have highlighted with the mouse. Please refer to chapter ' Last year's teacher ' for a more detailed description.

Couple
Use this function to create couplings for every lesson that you have selected in the matrix. Please refer to ' Untis User Manual ' for a more detailed description.

Extended de-coupling
Use this function to break couplings. Please refer to ' Untis User Manual ' for a more detailed description.

Lesson comparison
There is a separate section dealing with this function in this manual.

Settings
Settingshave already been described earlier in this chapter.

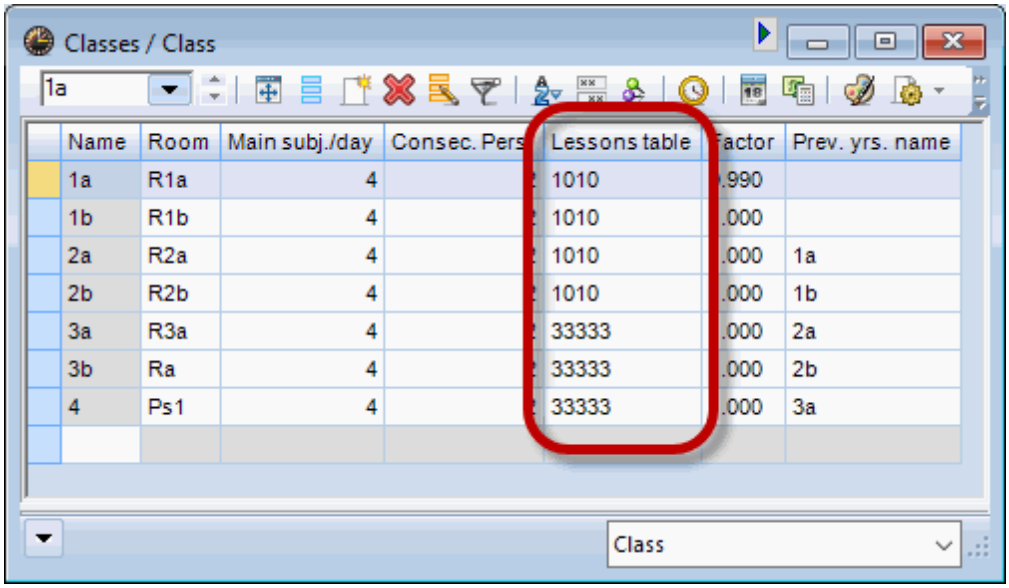
3.2.2 Lesson table (syllabus)

The general description of the lesson table is followed by an explanation of the various functions:

- Create lessons
- Add subjects to the lesson table
- Allocate classes

General description

You can distinguish between different school types under 'Classes | Master Data' by entering lesson tables.

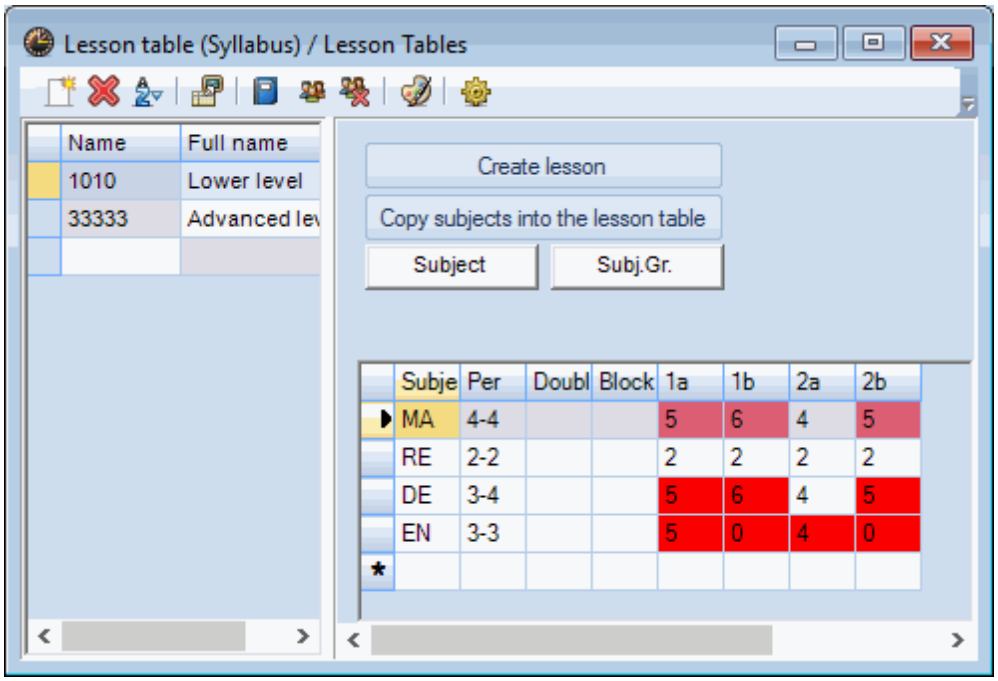


A lesson table is a list of subjects with an indication of the minimum and maximum number of periods that should be taught in the corresponding classes. On the one hand it serves to check whether the classes of one school type have the desired number of lessons in the subjects and subject groups defined, on the other hand you can use the lesson tables to create lessons automatically.

Not all subjects need to be entered in the lesson table - just those that you wish to check. The distribution of periods in accordance with the lesson table applies to all the classes for which you have entered this particular lesson table in the master data.

You can access the lesson tables via 'Modules | Lesson planning | Lesson table (syllabus)'.

The lesson table window is divided into two sections. On the left you can see a list of your lesson tables, on the right the table of subjects of the currently selected lesson table. The subject table consists of the following columns:



- **Subject** : This is where you can use both the subject short names as well as implicit or explicit subject groups . When subjects or explicit subject groups are entered, the system checks to see whether the element exists in the master data.

Tip: Elemen- rollup
You can use element rollups to include a whole list of subjects in one go by right-clicking on it and dragging it into the subject table.

- **Per** : In this column, enter the minimum and maximum number of periods per week - separated by commas - which should be taught for this subject in the classes in question. The entry '3,4' in the 'GE' row in the figure means that German should be taught to classes 1a, 1b and 2b for a minimum of 3 periods per week and a maximum of 4. If the minimum and maximum values are the same you only need enter the value once - entering e.g. '3' is the same as entering '3,3'.

- **Doub. per.** .: This is where you specify the minimum and maximum number of double periods that are to be formed from the previously entered periods. Entering '0-1' means that double periods need not be formed (minimum 0) but one may be formed (maximum 1).

This field is only important for the <Create lessons> function

- Block: Here you enter the size of the period block if you want to schedule this subject as a block. If you want to schedule this lesson as several blocks, then separate them by a comma.

This field is only important for the <Create lessons> function

- The subsequent columns tell you how many periods in the respective subject have been allotted for the corresponding classes. Fields with a **red background** indicate that the required **number of periods has not been reached or has been exceeded** .

Tip: Sorting

The table with the subjects for the lesson table can be sorted by each column just be clicking on the headings. You can also modify the order using drag&drop. Simply click on the grey field in front of the subject name and, holding the mouse button, drag the row to the desired position.

Deleting subjects

Clicking on the toolbar icon <Delete> or pressing <DEL> removes a subject from the table.

Copying subjects

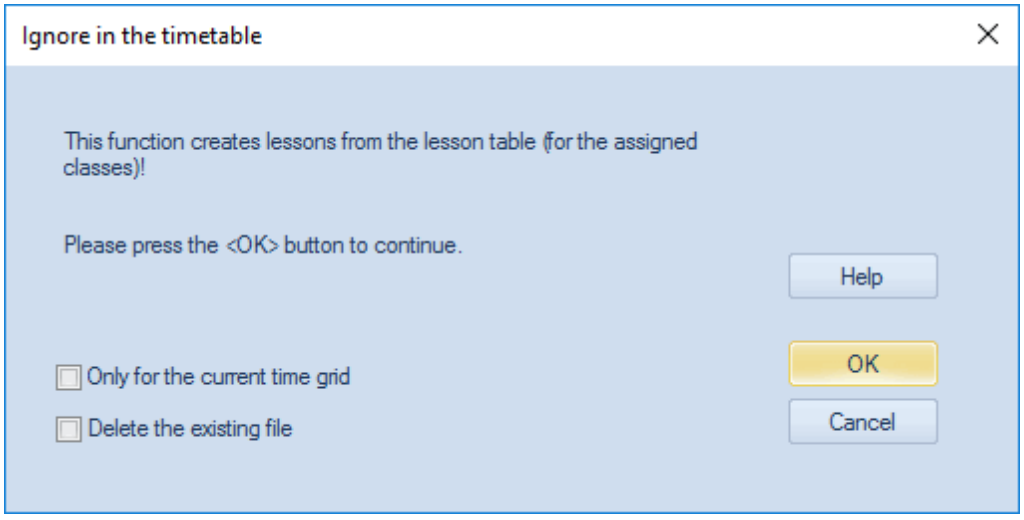
You can use the clipboard (STRG+C / STRG+V) to copy the table of subjects from one lesson table to a new one. Click on the table that you wish to copy andpress <CTRL>+C. Use <CTRL>+V key combination to insert the subject table.

Warning:
If the lesson table where you wish to copy to already contains a subject table, this will be overwritten.

3.2.2.1 Creating lessons

Use this function to create lessons from the entries in the lesson table for all classes that are included in a school type, provided the corresponding combination of subject and class does not already exist.

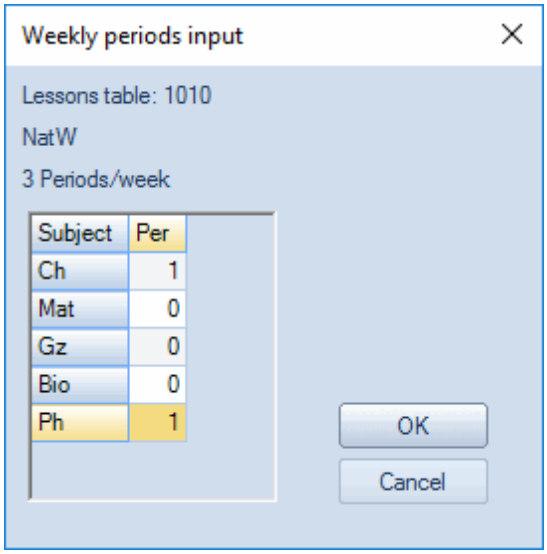
After the <Create lesson> button is pressed, a window is displayed offering further two setting options:



- **Only for the current time grid** : Checking this option limits the function to the current lesson table, otherwise lessons are created from the data in all lesson tables.
- **Delete the existing file** : If you have already created lessons you can delete them by checking this option.

When you confirm with <OK> Untis goes through the current lesson table (or all lesson tables) and creates weekly periods for all classes in the appropriate school types from the specified subjects.

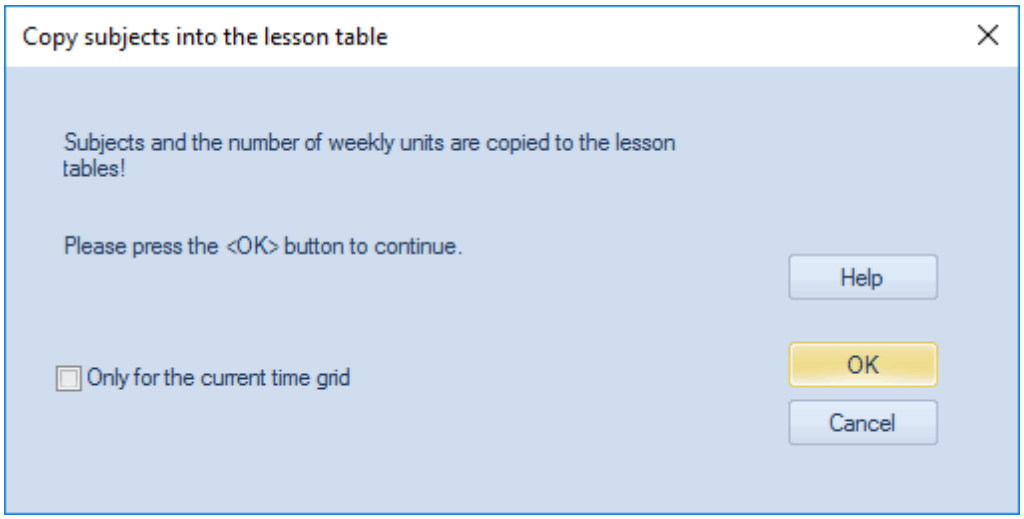
If the program encounters a subject group, a special window is displayed in which you can specify how many periods should be created for each subject.



3.2.2.2 Entering subjects in the lesson table

If you have already created lessons for the classes you can use these to create a lesson table. The only condition is that you have already entered the lesson tables for the individual classes in the master data.

You can choose to enter subjects just for the currently selected lesson table or for all lesson tables.

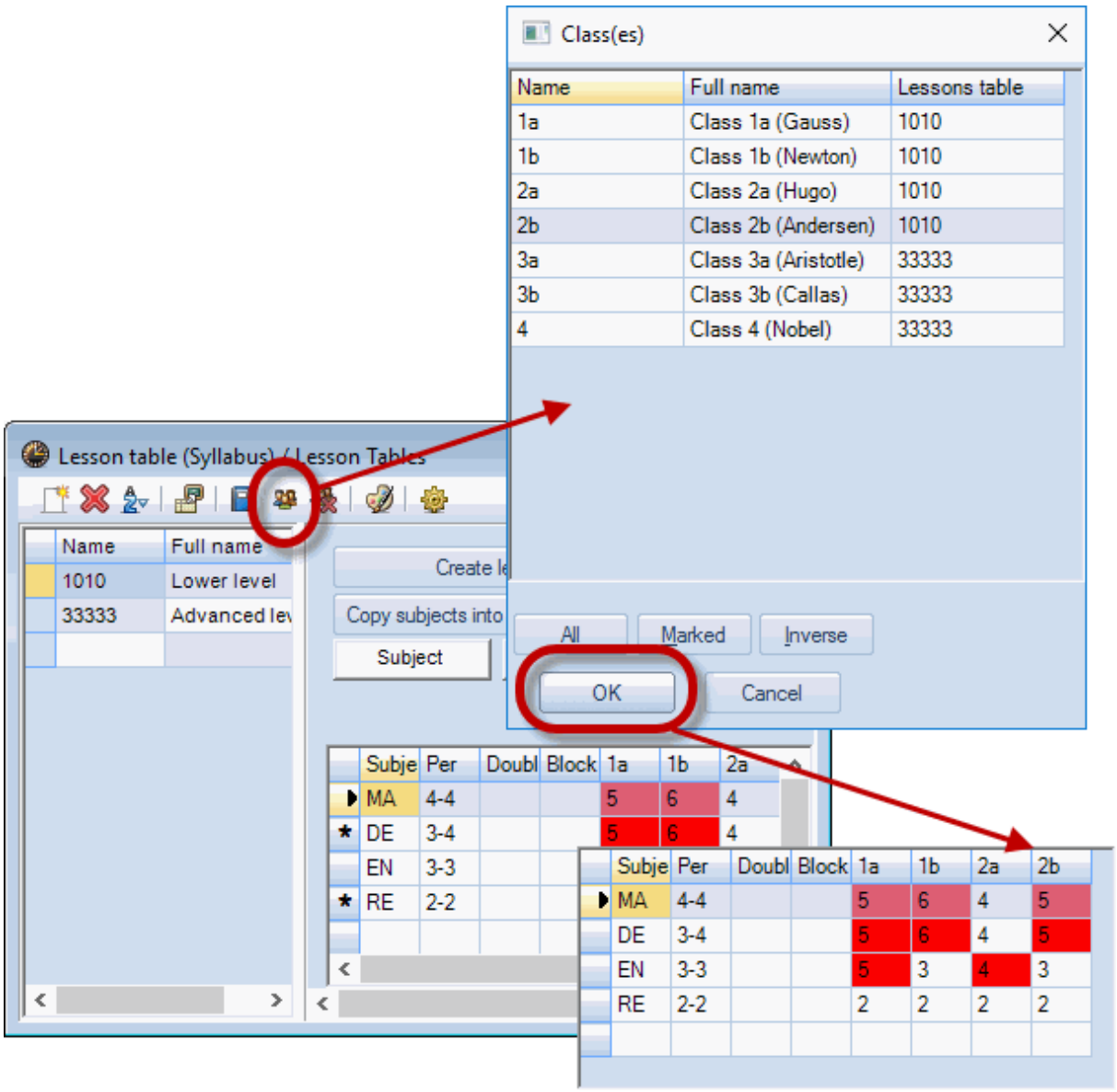


3.2.2.3 Allocating / deleting classes

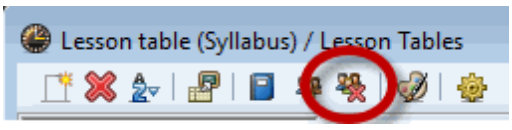
Allocating classes

Use this function to assign another class to a lesson table. In the figure, clicking on <OK> would

allocate the 1010 (lower level) lesson table to class 2b, in addition to classes 1a, 1b and 2a.



Deleting classes



Use this function to remove a class whose column you have selected in the subject table from the lesson table.

3.2.3 Automatic teacher assignment

In some cases (new classes, certain subjects at vocational schools etc.) assigning teachers to lessons can be effected automatically, in accordance with pre-defined rules, of course. Assignment can be performed either before or during optimisation.

- Teacher assignment before optimisation
- Teacher assignment during optimisation

3.2.3.1 Assignment before optimisation

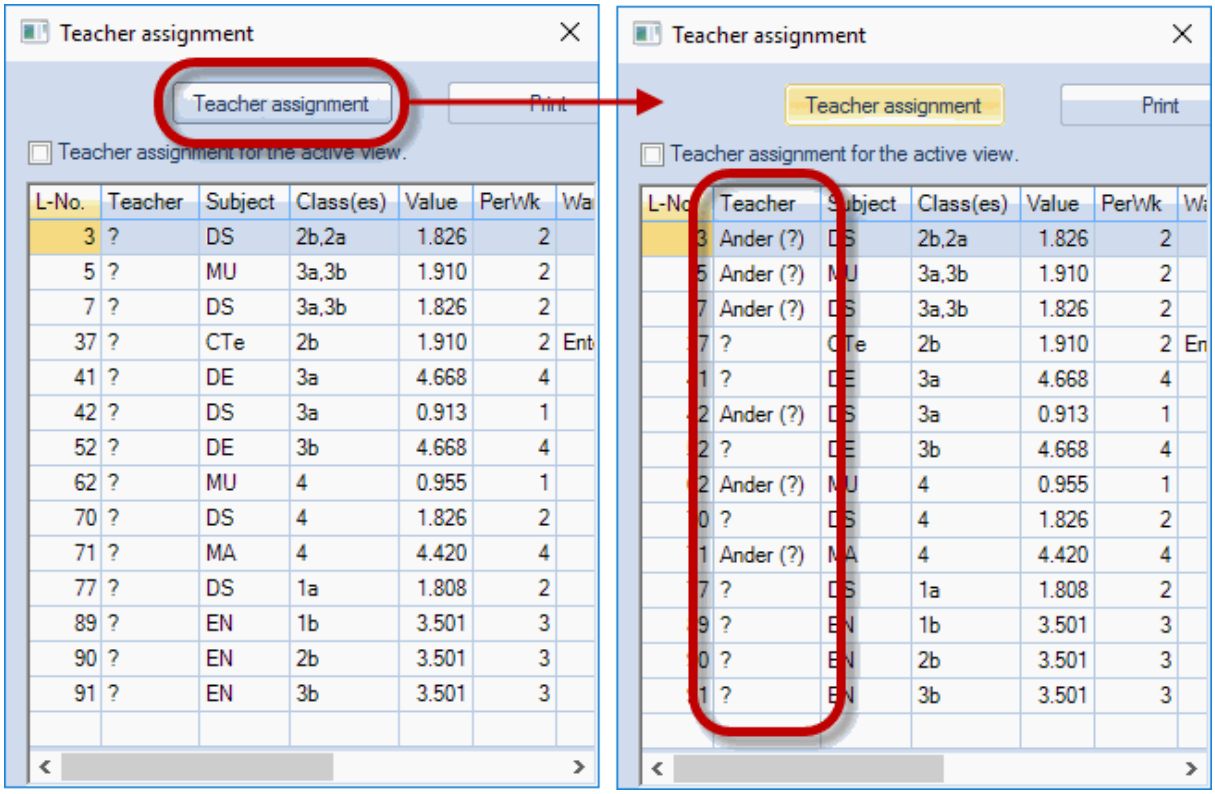
There are two ways of influencing teacher assignment before optimisation:

- Automatic teacher assignment
- Team optimisation

3.2.3.1.1 Teacher assignment

Teacher assignment With automatic teacher assignment ('Modules | Lesson planning | Teacher qualifications') lessons with a ?-teacher entry as teacher are automatically assigned a suitable teacher. Teacher suitability is determined on the basis of several factors:

- **Teaching qualification :** The teacher must be qualified to take the lesson (entry in teacher master data). If no qualifications have been entered, teacher assignment is aborted.
- **Teacher's weekly plan** : Automatic teacher assignment attempts to assign as many periods to each teacher as there are in his/her weekly plan. The weekly plan may only be exceeded if no other teacher is available to take the lesson. If no weekly plan has been entered, teacher assignment is aborted with an error message



Teacher assignment

The system first determines the subject that is the most difficult to assign on the basis of the number of open periods and the teaching qualifications available (please also refer to Subject bottlenecks' under 'Modules | Lesson planning | Teacher qualification' for more information). For this subject the system searches for the lessons with the most periods and assigns them the most suitable teacher. From the teachers who are qualified to teach the subject, the system assigns the one who needs most periods to fulfil his/her weekly plan.

If you have opened a class lessons windows ('Classes | Lessons') and check option 'Teacher assignment for the active view' the ?-teachers will only be replaced for this one class.

Note: Departments
If departments have been entered for the classes the application will ask if these should be taken into consideration. If there are multiple class couplings only the department of the first class in the coupling line will count. (Only with department timetable module)

3.2.3.1.2 Team optimisation

It is important to carefully consider how couplings and the formation of teaching teams should be modelled since the way lessons are planned can depend on this.

Planning becomes increasingly difficult the more teaching teams there are. It is easier if a teacher appears more often in fewer teams than if he/she teaches the same number of periods in a large number of different teams. Every additional teaching team that a teacher belongs to limits the extent to which he/she can be scheduled and conversely the extent to which a team can be scheduled.

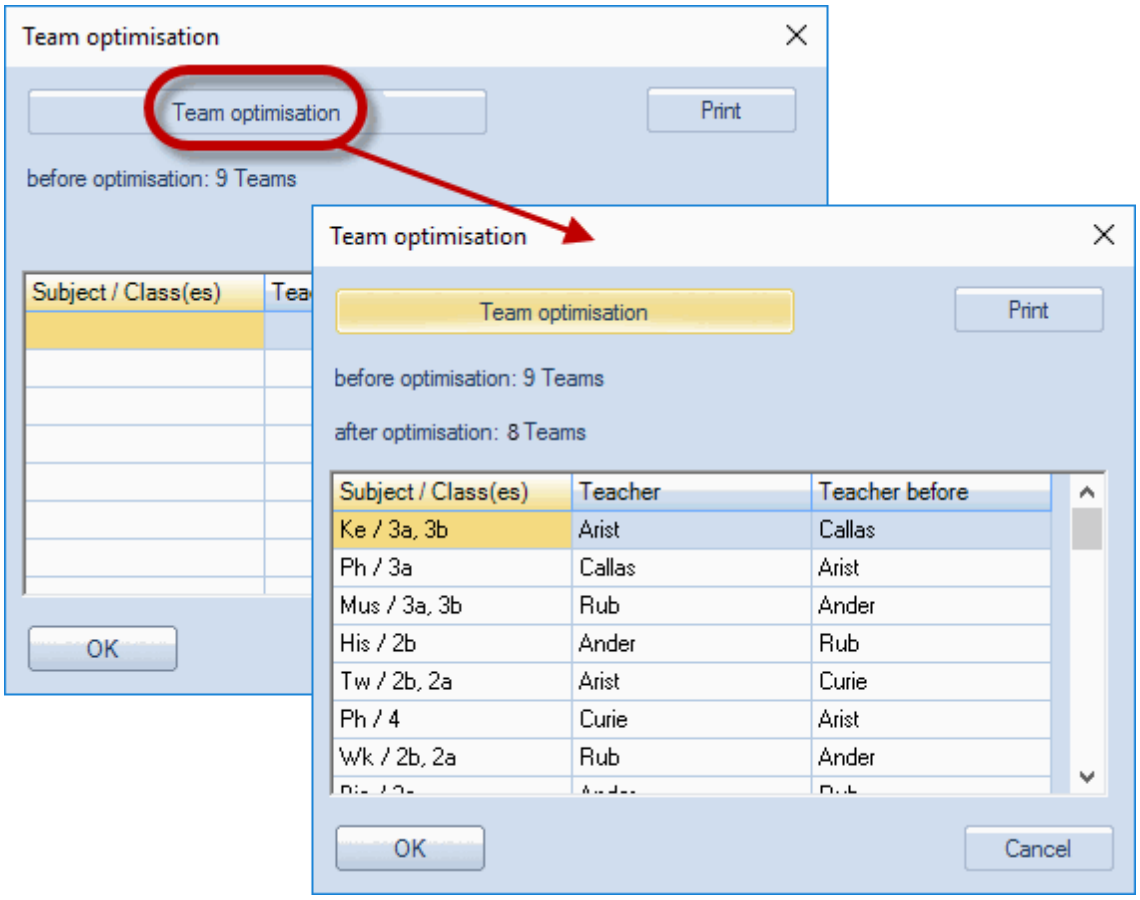
For this reason team optimisation attempts to reduce the number of teams.

In the process the following is taken into consideration:

- The teacher's number of hours may not change.
- The teacher will only be assigned to lessons which he/she is qualified to teach.

Performing team optimisation
Team optimisation is invoked via 'Modules | Lesson planning | Teacher qualification | Team optimisation'. A window is displayed containing the current number of teaching teams ('before optimisation').

Clicking on the <Team optimisation> icon causes Untis to search for teachers who can be exchanged between the individual teams in order to reduce the total number of teams. When the search ends, all the exchanges found are displayed as well as the new number of teaching teams.



Clicking on the <OK> button accepts the team optimisation; clicking on <Cancel> retains the original teams.

Reducing the number of teaching teams results in more scheduling options being available for the optimisation process. This makes for better timetables.

3.2.3.2 Assignment during optimisation

Untis also allows teacher assignment to be changedduring optimisation. This means that Untis may replace the teacher that you have entered for a lesson with another who is more suitable from the

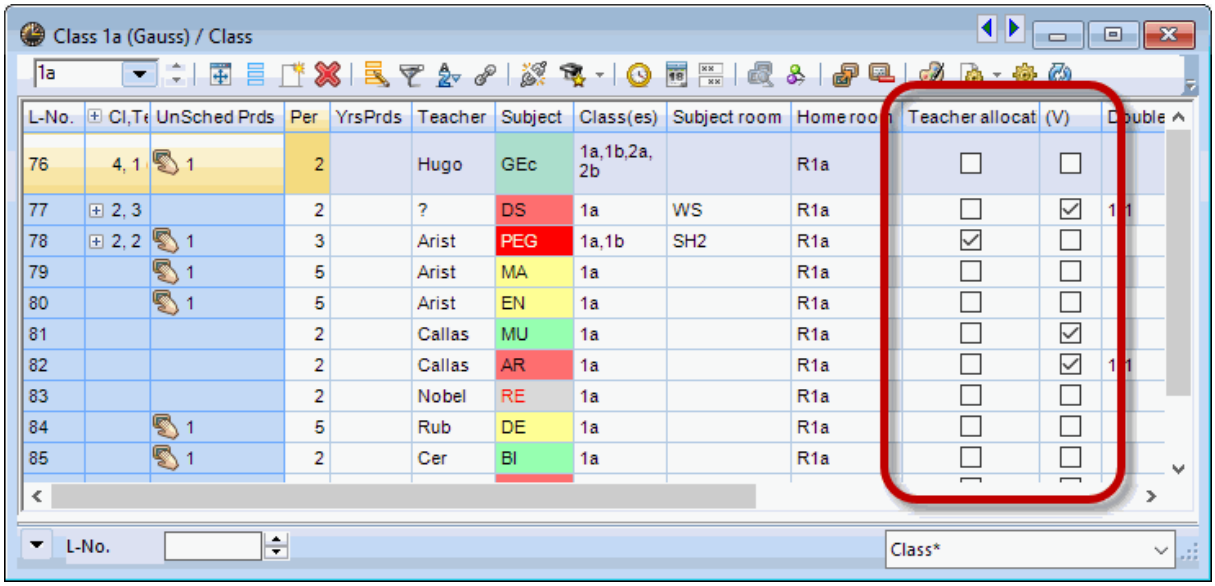
scheduling point of view. Such replacements will of course only be performed for lessons where you expressly wish this to happen (detailed explanations follow later).

Automatic teacher assignment during optimisation is also contained to a limited degree in the standard package. However, it is only with the 'Lesson planning' module and the associated possibility of entering teaching qualifications that it shows its full potential.

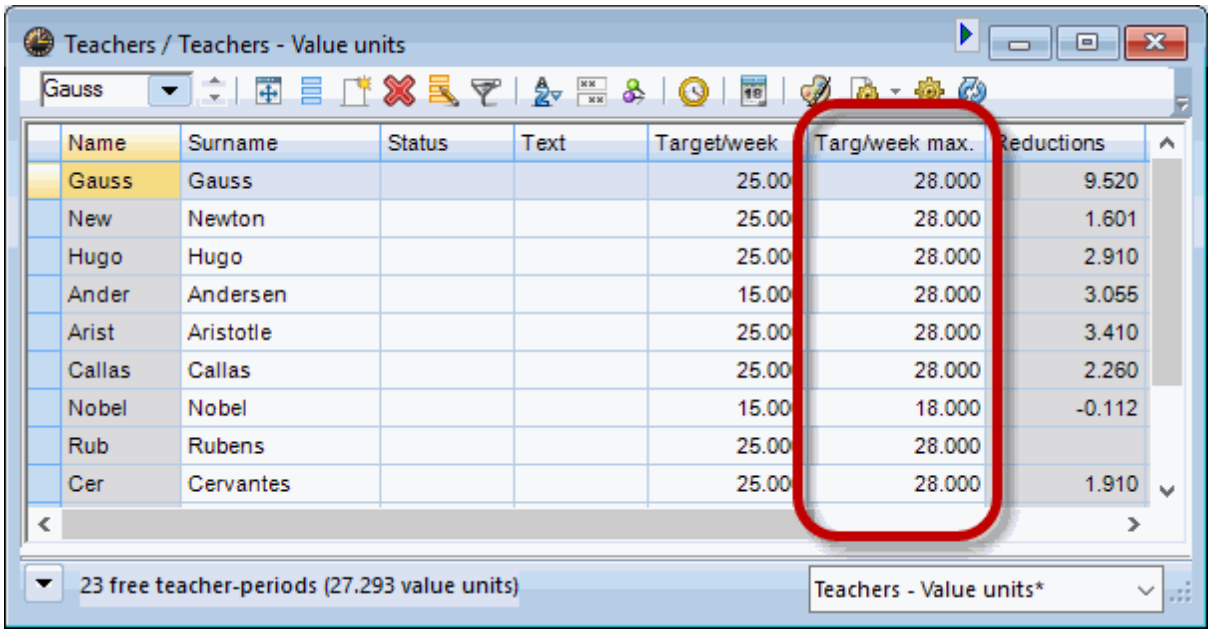
In order to be able to use the variable teacher assignment during optimisation at least one of the following conditions - in addition to the entered qualifications - must be met:

- There are lessons where the ?-teacher is assigned.
- There are lessons where the '(V) Variable teacher' code has been set.

Warning: Couplings
The 'V' code relates to all teachers of a particular lesson. If you do not wish to replace individual teachers in a coupled lesson, you must mark the relevant coupling line using the 'Fixed teacher assign.' box. This has the effect of suspending the 'V' code for this teacher.



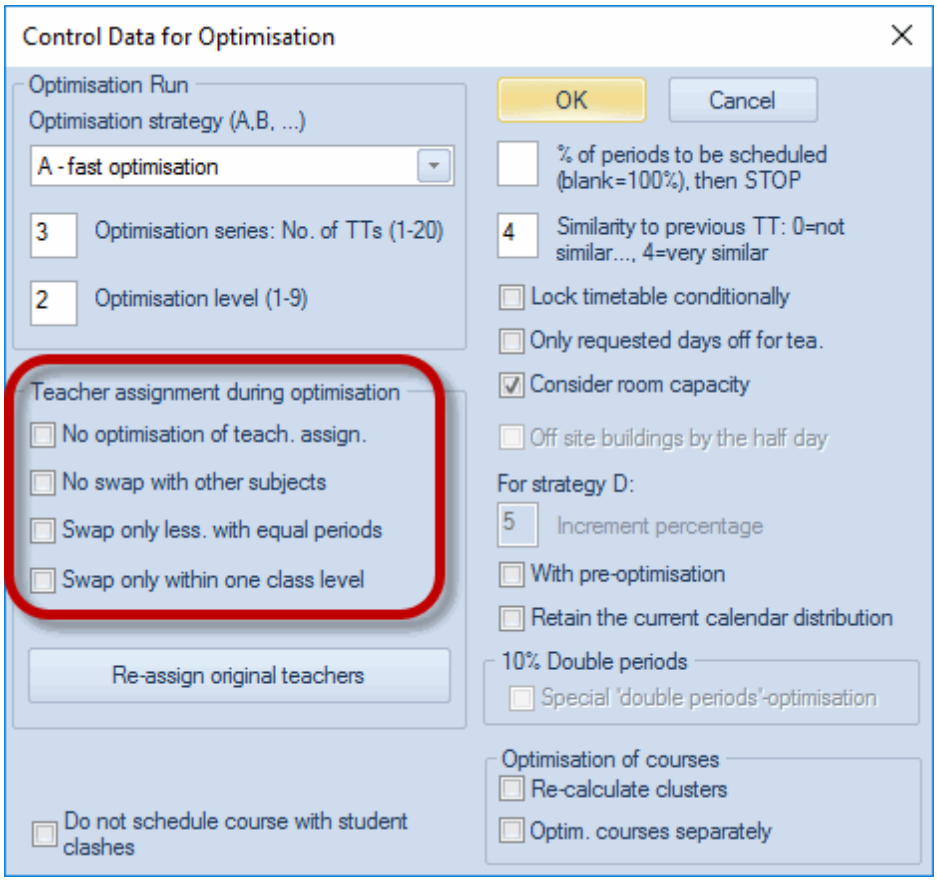
Whereas the standard package only allows those teachers to be exchanged who have the same subject with the same number of periods, the lesson planning module allows Untis to choose from all teachers who have an appropriate qualification and whose 'Targ/week max' value (to be found on the 'Values' tab under 'Teachers | Master Data') would not be exceeded in the event of an exchange.



Bottlenecks due to an unfavourable assignment of teachers to lessons will be avoided in the process of optimisation.

3.2.3.2.1 Settings for teacher optimisation

The figure below shows the settings in the optimisation dialogue ('Start | Optimisation') for automatic teacher assignment.



The individual settings have the following meaning:

- **No optimisation of teacher assign.** : Checking this box deactivates the teacher exchange. All '(V) Variable teacher' codes will be ignored.

  With this setting ?-teachers will not be changed, either.
- **No swap with other subjects** : Exchanges will only be made with the same subject.
- **Swap only less. with equal periods** : Exchanges will only be made with lessons that have the same number of periods.
- **Swap only within one class level** : Exchanges will only be made with lessons that belong to the same class level (year). The class level (year) is defined with the corresponding entry under 'Classes | Master Data'.
- **Re-assign original teachers** : Clicking on this button results in all teacher exchanges performed in earlier optimisations being deleted. This means that every subject will be taught by the teacher entered for that lesson.

4 Part 2: Value calculation

Here you find all information on Value calculation.

- Values

- Examples
- Value calculation and multi-week timetable

4.1 Values

Values It is often the case that lessons do not all contribute equally to a teacher's full complement of hours. For example, the subject or the class level (year) taught actually determines how much a lesson is 'worth'.

If you have the 'Multi-week timetable' module you can also take interruptions and time restrictions of the lessons into consideration, which also play an important role in value calculation.

As value calculation is relevant at a point in time when lessons have not yet been scheduled (e.g. when subjects are being allocated), it is not possible to know in advance whether the lessons will be scheduled for a day when there is no school (e.g. because of a public holiday).

Therefore the calculation of yearly values (or for example when periods are limited in the multi-week timetable module) it is assumed when counting the weeks that 'all or none' are included. A week in which lessons are held on only one day (e.g. before or after holidays) counts the same as a week with five school days.

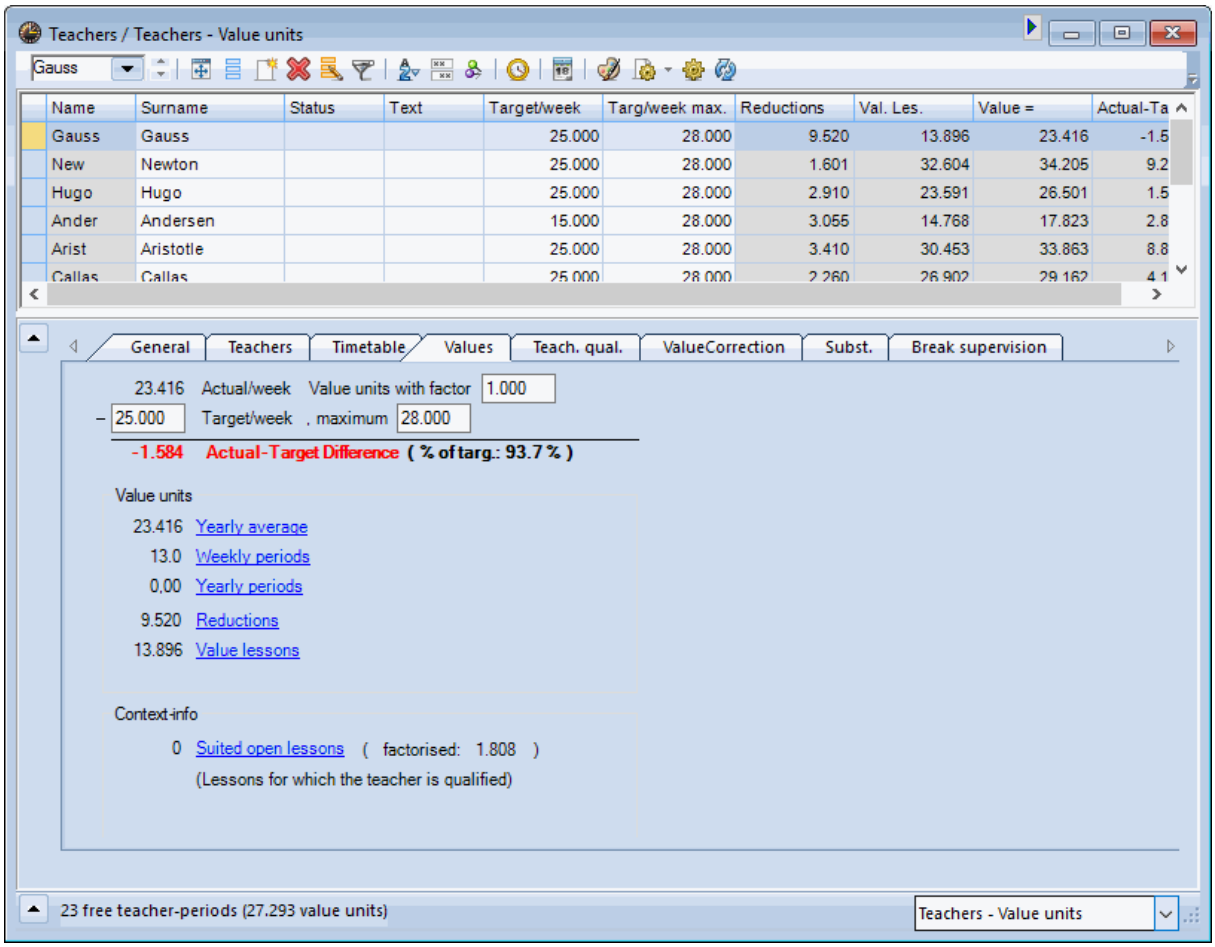
Warning:
The only important thing is that it is basically possible for a lesson to be scheduled in a particular week.

4.1.1 Entering values and factors

Each period automatically has a value of 1 unless you set a different value. You have various possibilities to change this default value if you wish, for example by specifying factors assigned to subjects , teachers or classes. The following section explains the possibilities in more detail.

4.1.1.1 Teachers | Master Data

The most important parameters and entries for value calculation can be found on the 'Values' tab in the form view in the master data of the teachers.



- **Plan/week** : This is where you enter the lesson value units that the teacher must take each week to fulfil his/her teaching commitment.

- **Targ/week max** : This field is important for variable teacher assignment during optimisation. When the optimisation process assigns this teacher lessons from another teacher, the system will check to ensure that his/her total value units do not exceed this value.
- **Per** : This is where the number of weekly periods is displayed.

- **Value lesson** : Here the value units are shown coming from lessons (i.e. not from reductions).

- Reductions: This is the total of reductions entered for the relevant teacher under 'Lessons | Reductions'.

- **Value units** : Here you can see how much the teacher's lessons are 'worth'. The next few pages describe how this value is calculated.

- **Actual-planned** : This value is the difference between the teacher's (contractually) agreed workload and the currently assigned value units. A positive value therefore signifies overemployment while a negative value means that this teacher must take additional lessons in order to fulfil his/her teaching commitment.

Percent of target : This field indicates how much of the teacher's target has been met in percentage terms, i.e. you can see immediately whether the teacher is working below or above capacity.

- **Yearly average** : The yearly average is the average lesson value taken over all terms.
- **Factor** : Depending on the teacher's seniority the periods that he/she teaches are weighted. The value that you enter here will be multiplied with the number of periods per week.

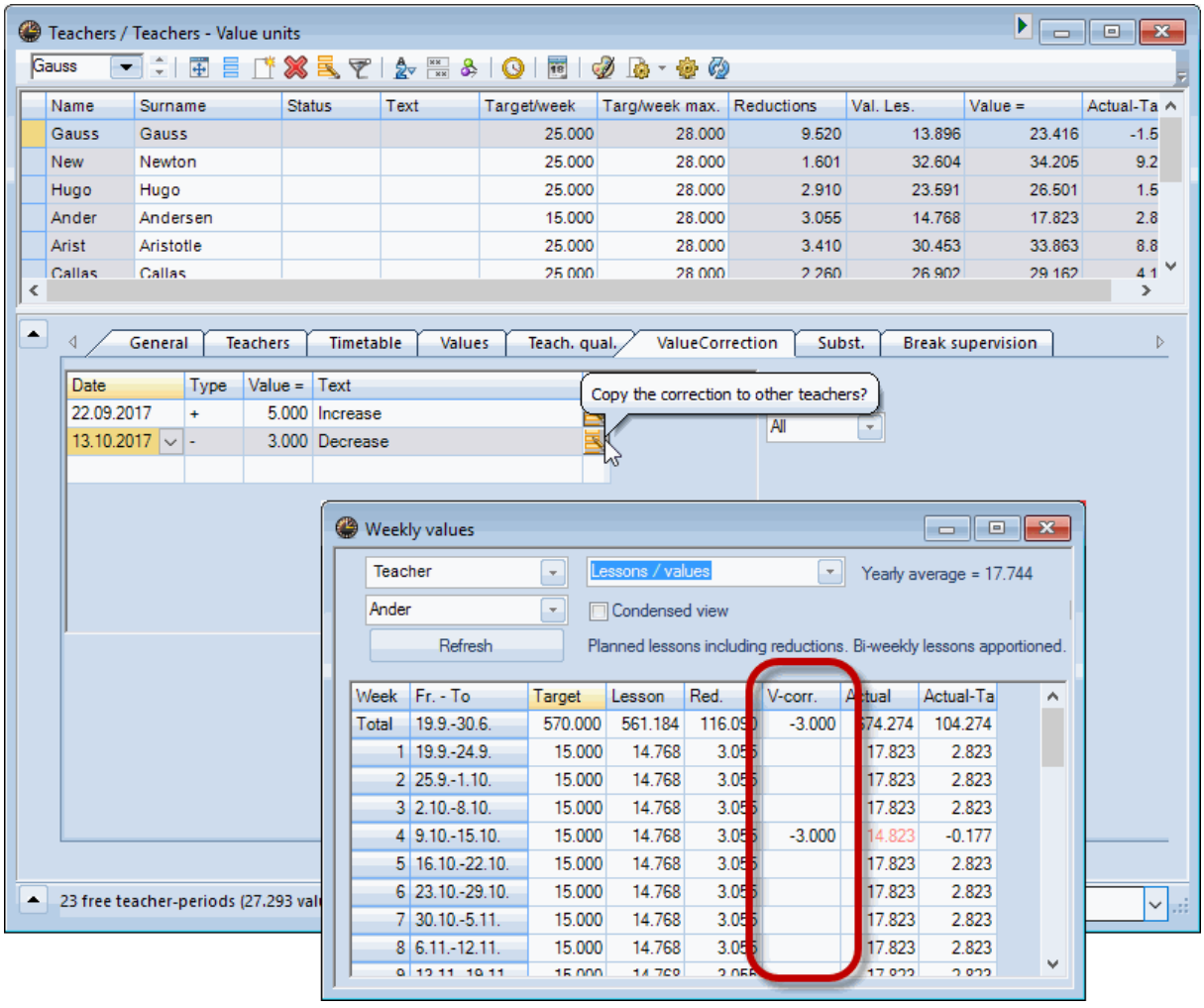
4.1.1.1.1 Value correction

Value correction enables you to increase or reduce the value units of a teacher at a certain date.

To do this, open 'Master data | Teachers' and activate the 'Value correction' tab (or 'Modules | Value calculation | Value corrections').

Enter the desired date and for the type select '+' for an increase in the value or '-' for a reduction in the value.

You will see the changed values in the weekly values .

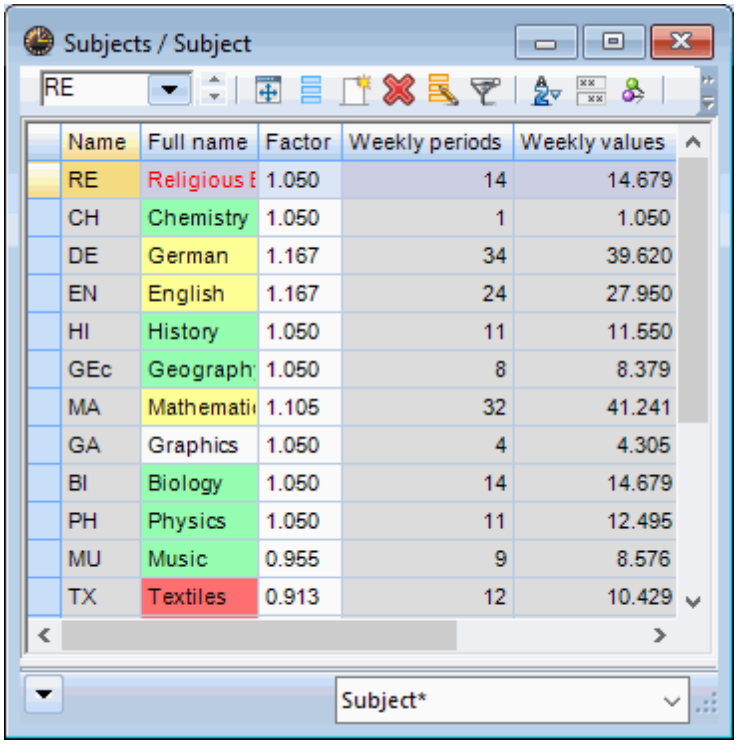


Note: copy value calculation

If you want to copy a calue correction from one teacher to another just click on the button right to the entry of the value correction.

4.1.1.2 Subjects | Master Data

You can display the main information and input options for value calculation using <Grid adjustment> in the 'Value calculation' section of subject master data.

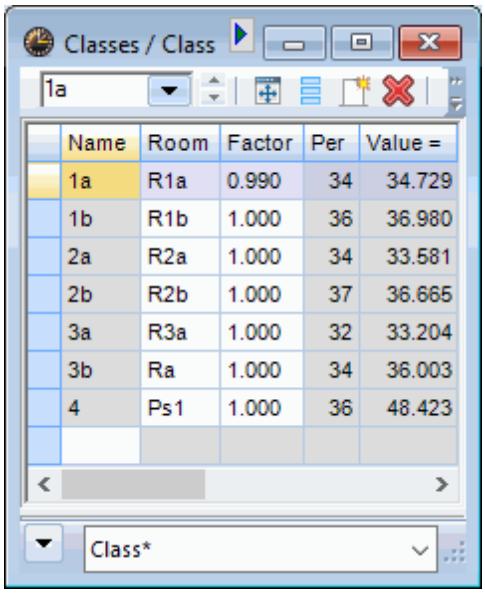


- **Factor** : Use subject factors to specify how different subjects have different value 'ratings', i.e. some factors 'count more' than others. At Austrian high schools, for example, English is weighted with a value of 1.167 while sport has a value of only 0.955.
- **Periods/week** Here you can see for how many periods per week this subject is taught at the school.
- **Value units** : This value indicates what the periods displayed are worth at the school. Depending on whether you selected the 'Yearly values' option in the settings for value calculation or not, the value indicated here refers either to a week or to the whole school year.

You can find these settings on the 'Value calculation' tab under 'Start | Settings | Miscellaneous' (please refer to chapter ' Value calculation settings').

4.1.1.3 Classes | Master Data

You can display the main information and input options for value calculation using <Grid adjustment> in the 'Value calculation' section of class master data.



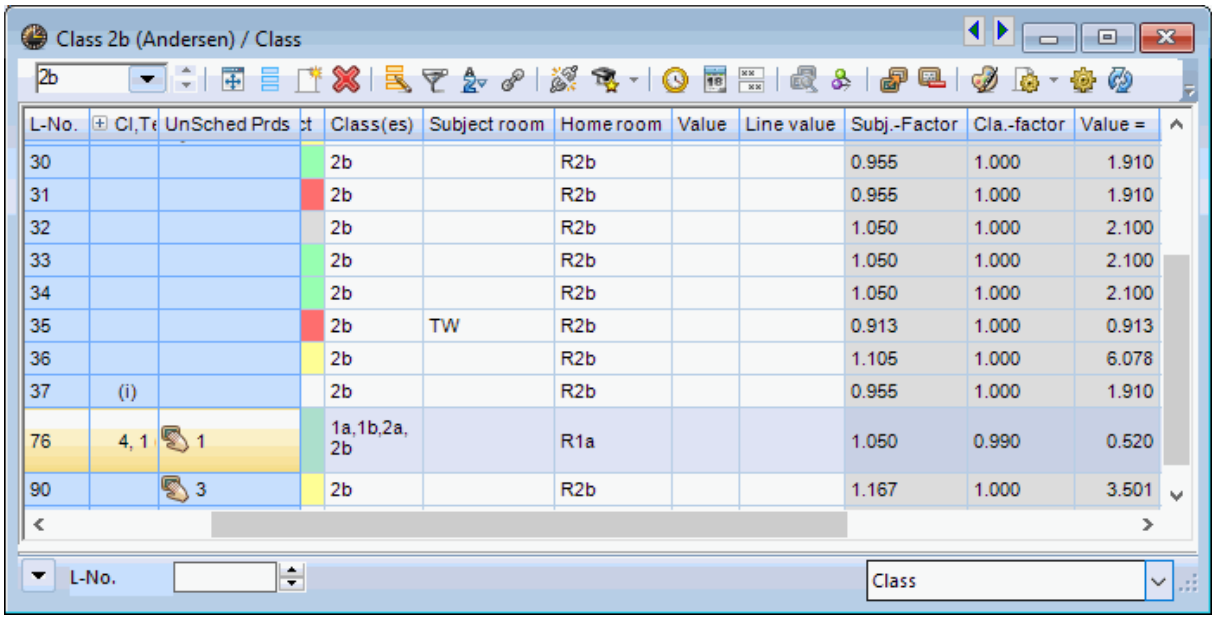
- **Factor:** Here you can specify how a lesson in this class should be weighted, e.g. lessons in the sixth form could be valued higher than in the lower grades. The class factors are often used to enhance the value of evening school lessons:

- **Value units:** The total value of the lessons taught in this class

- **Periods/week:** The number of periods per week that this class is taught..

4.1.1.4 Lesson values

As with the master data, you will find several columns referring to value calculation in all the individual lesson views (e.g. 'Teachers | Lessons').



- **Value** : You can enter an absolute value in this field, or a factor that overrides all other factors.

Input value	Meaning	Effect
4.50	fixed value	Overrides teacher, class and subject factors, but not time limitations
=4.50	absolute value	Overrides all factors and time limitations
*4.50	value factor	Does not override other factors or time limitations; additional factor that may e.g. enhance the value of certain lessons.
+4.50	summand	Does not override other factors or time limitations; additional summand that may e.g. enhance the value of certain lessons

Note: positive and negative
All values and factors can be entered as positive or negative numbers.

You will find examples in the next chapter ' Examples of lesson values ' and Fixed values and factors for time limitations '.

- **Line value/factor:** Whereas the first input field affects the whole lesson, you can enter values here that influence a single coupling line.
- **Value units:** This entry shows you the current total value for the lesson.
- **Subject factor:** This entry displays the factor for the subject.
- **Class factor:** This entry displays the factor for the class.
- **Target per./year:** You can use this field to specify how many periods of this lesson should be taught over the school year as a whole.

4.1.1.4.1 Examples of lesson values

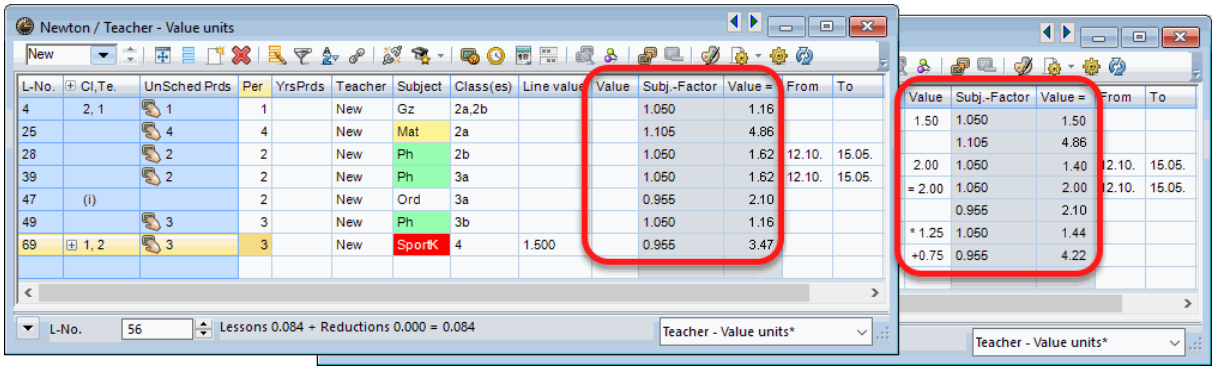
You can influence the value of a lesson in several ways.

- **Directly** by entering a fixed value. This results in all other input values and factors that affect this lesson being overridden. If you precede the value with an additional equals sign'=', time limitations will also be ignored. (This will be illustrated later in the course of a another example.)

Negative values are also valid.

- **Indirectly** , by preceding the existing value with a '+'or '*'. This defines either a summand that is added to the total value of the lesson or a further factor that is multiplied with the value.

The figure below shows you teacher Newton's lessons. The 'Value = ' column displays the total value of the lesson in question.



- A fixed value of 1.500 has been entered in the second line (lesson number 4). The original value of this lesson - 1.16 - has been overwritten by this new value and the individual factors thereby overridden.

- In the third row you will see the entry 2.000 for lesson 28. However, the 'Value=' column contains the value 1,40 since the time limitation has been taken into account.

- Lesson 39 is very similar to lesson 26 However, in this case '=2.000' was entered under value. Prefixing the equals sign means that the time limitation is **not** taken into account.

The modifications and entries described always have an effect on lessons as a whole. For example, entering a fixed value for a coupled lesson that is held by two teachers can have an effect on both of them.

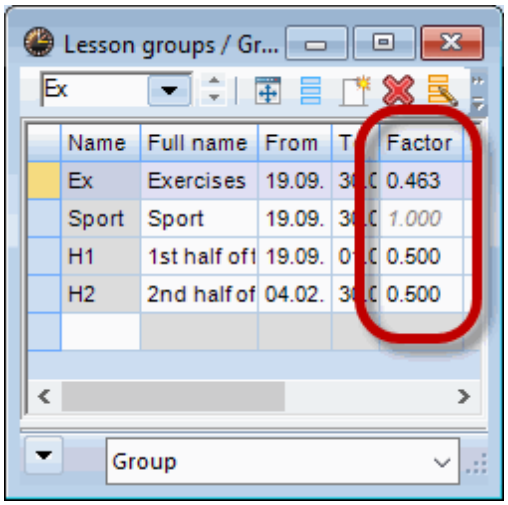
Note: Line values
Use the 'Line value' input field if the entry should only apply to one teacher. This field does not apply to the whole lesson. It only affects the coupling row in question. As with the 'Value' field, you can enter additional factors, summands or fixed values in the 'Line value' field.

The 'Examples of value calculation' chapter contains an example dealing with the line value .

You can find a more detailed description of how values are calculated in chapter ' Examples of value calculation.

4.1.1.5 Factors for lesson groups

If you have the 'Multi-week timetable' module, lesson groups give you a further possibility to influence the value of a lesson.



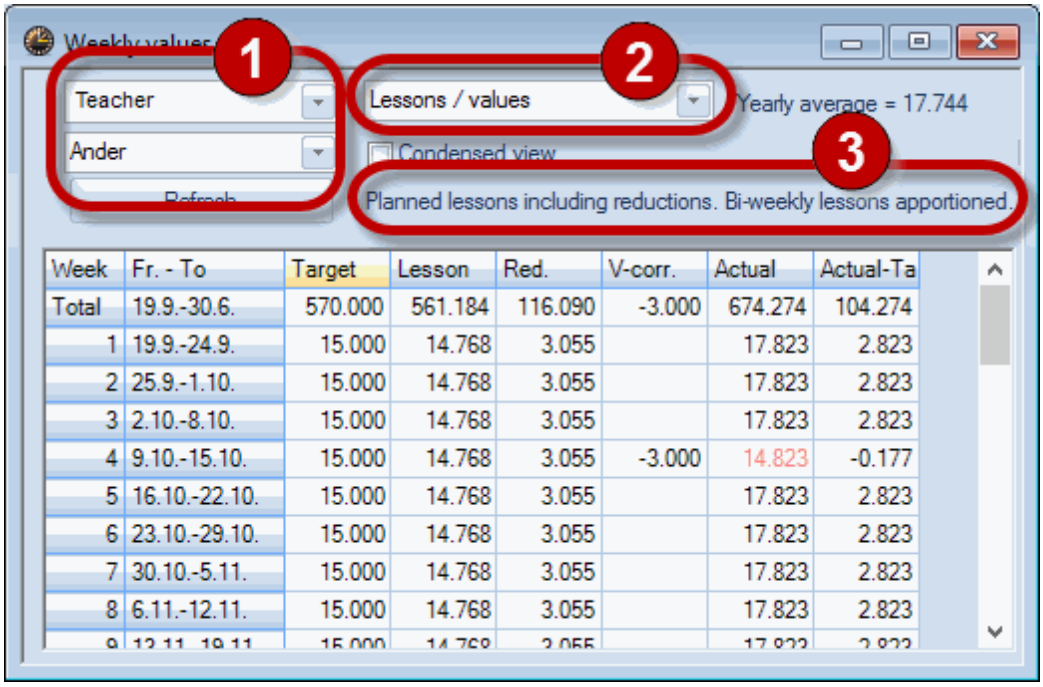
A group factor that you define for lesson groups overrides a value reduction caused by lesson or group time limitations. Please refer to the 'Lesson groups' chapter for more information as well as an example.

4.1.2 Weekly values

It has already been mentioned that the number of weeks in which lessons can generally be scheduled is important for value calculation. Where a lesson is located in the timetable and whether it can or cannot take place in a certain week - for example due to a public holiday - is not taken into account.

However, the actual value units that are actually assigned to a teacher or to a class in a certain week can be important. For this purpose there exists the 'Weekly values' window that you can find under 'Modules | Value calculation | Weekly values'. While lesson scheduling does not play a major role in 'normal' value calculation - just the question of whether they can be scheduled in certain weeks - the values that you find in this table are based on actual timetables.

In the table you can select for which teacher or class (1) and how (2) the weekly values should be displayed. Below the two input fields you can find a brief explanation of the values displayed (3).



Week	Fr. - To	Target	Lesson	Red.	V-corr.	Actual	Actual-Ta
Total	19.9.-30.6.	570.000	561.184	116.090	-3.000	674.274	104.274
1	19.9.-24.9.	15.000	14.768	3.055		17.823	2.823
2	25.9.-1.10.	15.000	14.768	3.055		17.823	2.823
3	2.10.-8.10.	15.000	14.768	3.055		17.823	2.823
4	9.10.-15.10.	15.000	14.768	3.055	-3.000	14.823	-0.177
5	16.10.-22.10.	15.000	14.768	3.055		17.823	2.823
6	23.10.-29.10.	15.000	14.768	3.055		17.823	2.823
7	30.10.-5.11.	15.000	14.768	3.055		17.823	2.823
8	6.11.-12.11.	15.000	14.768	3.055		17.823	2.823

As an alternative to displaying lesson periods in the usual way, weekly values can display the total of lessons scheduled or held in terms of hours and minutes. This is particularly necessary when using different timetable grids or with periods of different duration during the day.

Weekly values can be displayed for teachers and for classes.

4.1.2.1 Weekly values for teachers

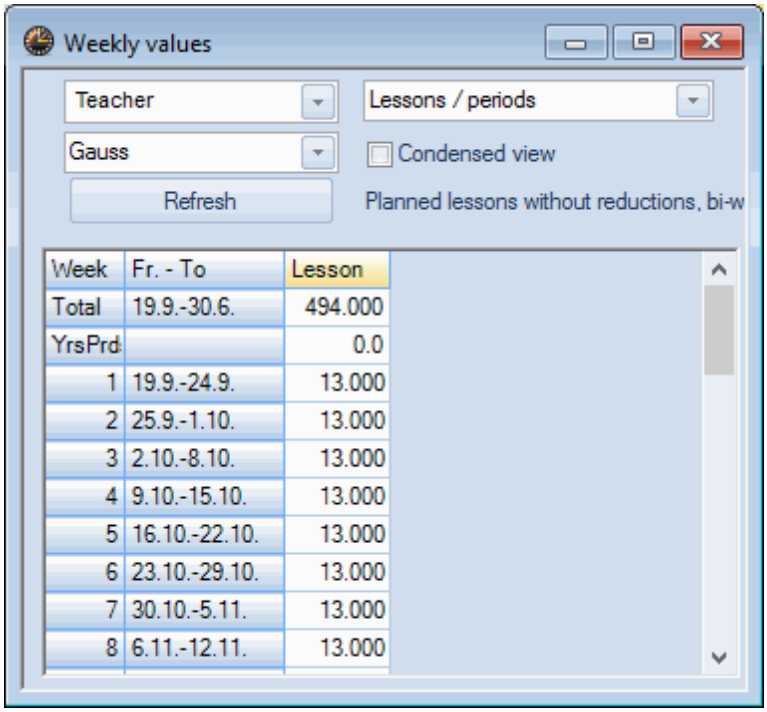
You can choose between the following types of weekly value:

- Lessons / periods
- Lessons / values
- Timetable / periods
- Timetable / values
- Cover plan / periods

- Cover planning / values
- Statement

4.1.2.1.1 Lessons / periods

This displays the periods defined under 'Teachers | Lessons' that are active in the given week, irrespective of whether these periods have actually been scheduled or not. Each week begun counts as a full week, and public holidays are ignored. Weeks with no school day appear with a lesson value of '0' for both 'Plan' and 'Lesson'.



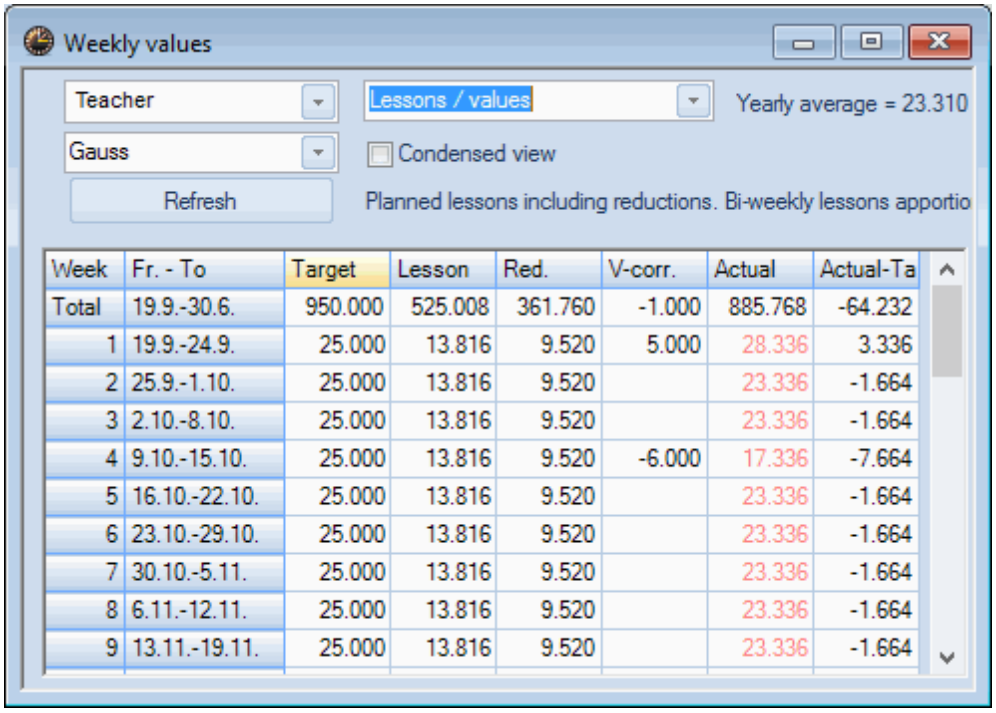
Week	Fr. - To	Lesson
Total	19.9.-30.6.	494.000
YrsPrd		0.0
1	19.9.-24.9.	13.000
2	25.9.-1.10.	13.000
3	2.10.-8.10.	13.000
4	9.10.-15.10.	13.000
5	16.10.-22.10.	13.000
6	23.10.-29.10.	13.000
7	30.10.-5.11.	13.000
8	6.11.-12.11.	13.000

4.1.2.1.2 Lessons / values

This is where the values for scheduled lessons are output. This setting displays total value of lessons after the planned target, followed by reductions and any value corrections . The sum of these three columns results in the 'actual' value.

The last column displays any difference between actual and planned.

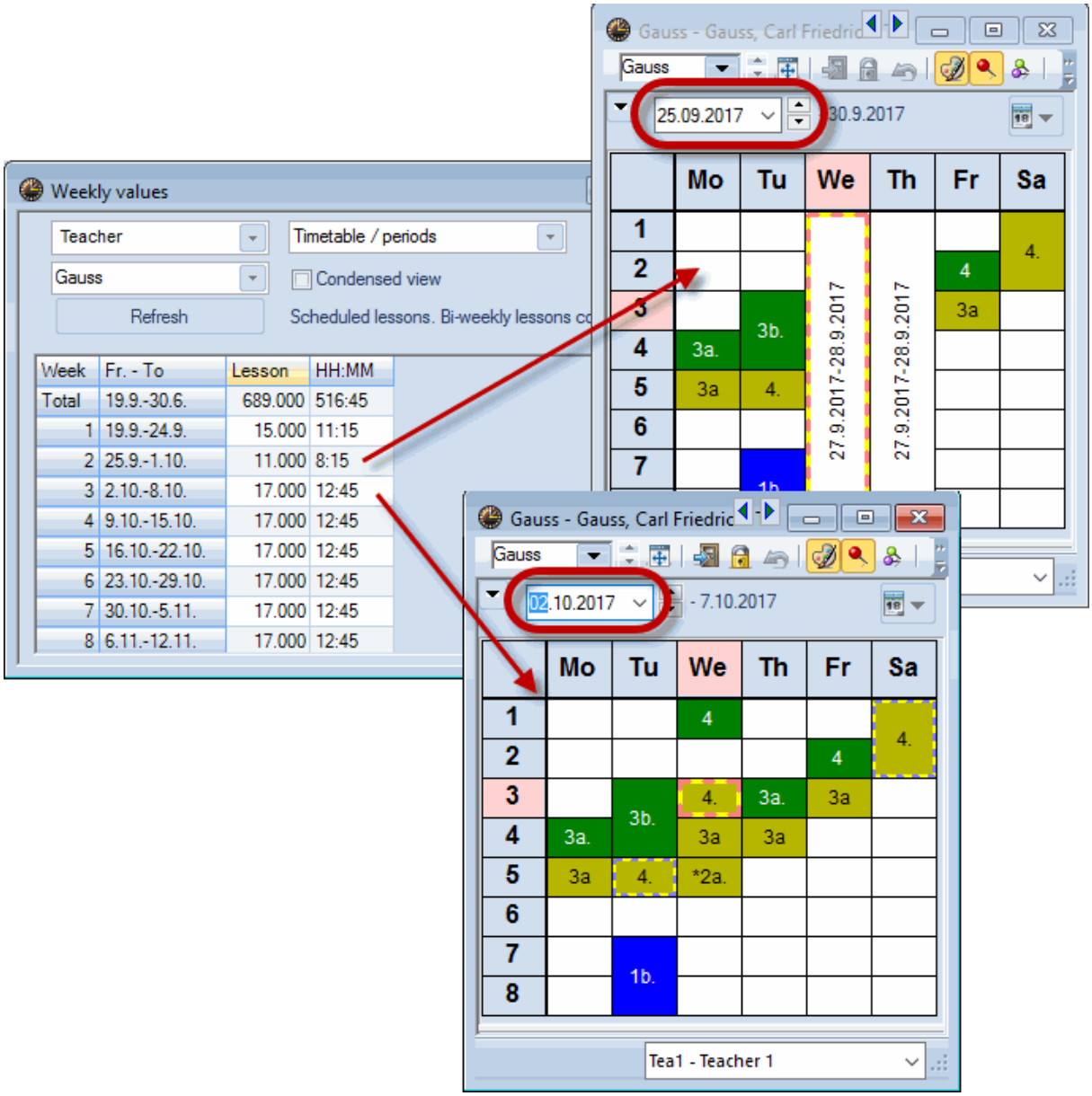
The yearly average is displayed at the top of the screen.



Week	Fr. - To	Target	Lesson	Red.	V-corr.	Actual	Actual-Ta
Total	19.9.-30.6.	950.000	525.008	361.760	-1.000	885.768	-64.232
1	19.9.-24.9.	25.000	13.816	9.520	5.000	28.336	3.336
2	25.9.-1.10.	25.000	13.816	9.520		23.336	-1.664
3	2.10.-8.10.	25.000	13.816	9.520		23.336	-1.664
4	9.10.-15.10.	25.000	13.816	9.520	-6.000	17.336	-7.664
5	16.10.-22.10.	25.000	13.816	9.520		23.336	-1.664
6	23.10.-29.10.	25.000	13.816	9.520		23.336	-1.664
7	30.10.-5.11.	25.000	13.816	9.520		23.336	-1.664
8	6.11.-12.11.	25.000	13.816	9.520		23.336	-1.664
9	13.11.-19.11.	25.000	13.816	9.520		23.336	-1.664

4.1.2.1.3 Timetable / periods

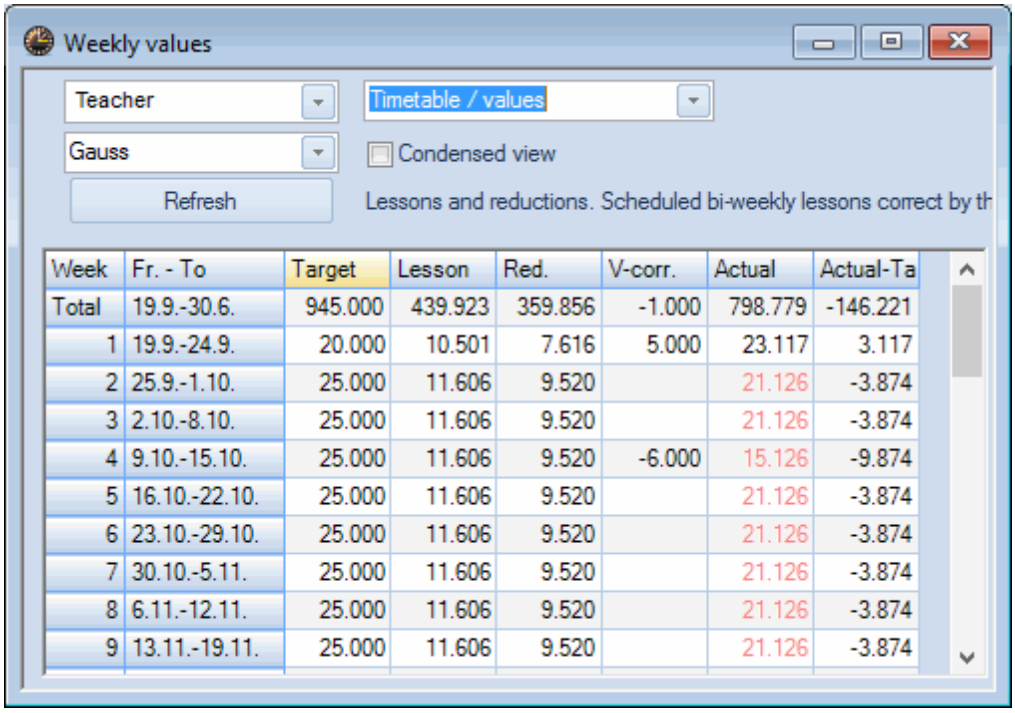
With this setting you can see - in the 'Lesson' column - how many periods this teacher has actually taught in the week in question. Holidays are taken into consideration. The 'HH:MM' column shows the duration of the lessons held in hours and minutes.



Warning: Public holidays
On public holidays - defined as such under 'Start | Settings | Holidays' - the scheduled periods are counted as if having been held..

4.1.2.1.4 Timetable / values:

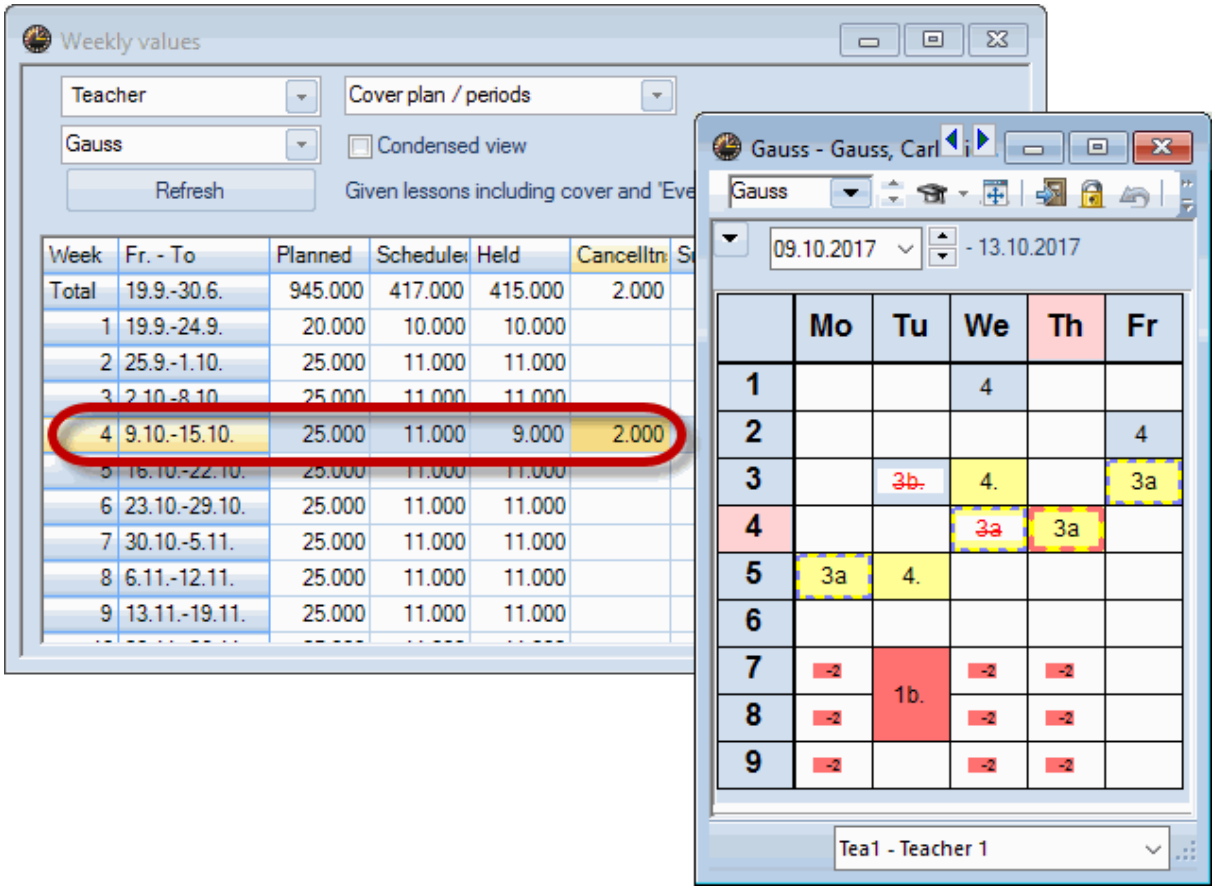
This is where the values for the **scheduled** periods are displayed in a similar way to ' Lessons | Values '. Values in columns 'Plan' and ' Reduction ' are calculated on a proportional basis. Thus the plan value for a six-day week with two holidays without lessons is reduced by one third (see week 4).



Week	Fr. - To	Target	Lesson	Red.	V-corr.	Actual	Actual-Ta
Total	19.9.-30.6.	945.000	439.923	359.856	-1.000	798.779	-146.221
1	19.9.-24.9.	20.000	10.501	7.616	5.000	23.117	3.117
2	25.9.-1.10.	25.000	11.606	9.520		21.126	-3.874
3	2.10.-8.10.	25.000	11.606	9.520		21.126	-3.874
4	9.10.-15.10.	25.000	11.606	9.520	-6.000	15.126	-9.874
5	16.10.-22.10.	25.000	11.606	9.520		21.126	-3.874
6	23.10.-29.10.	25.000	11.606	9.520		21.126	-3.874
7	30.10.-5.11.	25.000	11.606	9.520		21.126	-3.874
8	6.11.-12.11.	25.000	11.606	9.520		21.126	-3.874
9	13.11.-19.11.	25.000	11.606	9.520		21.126	-3.874

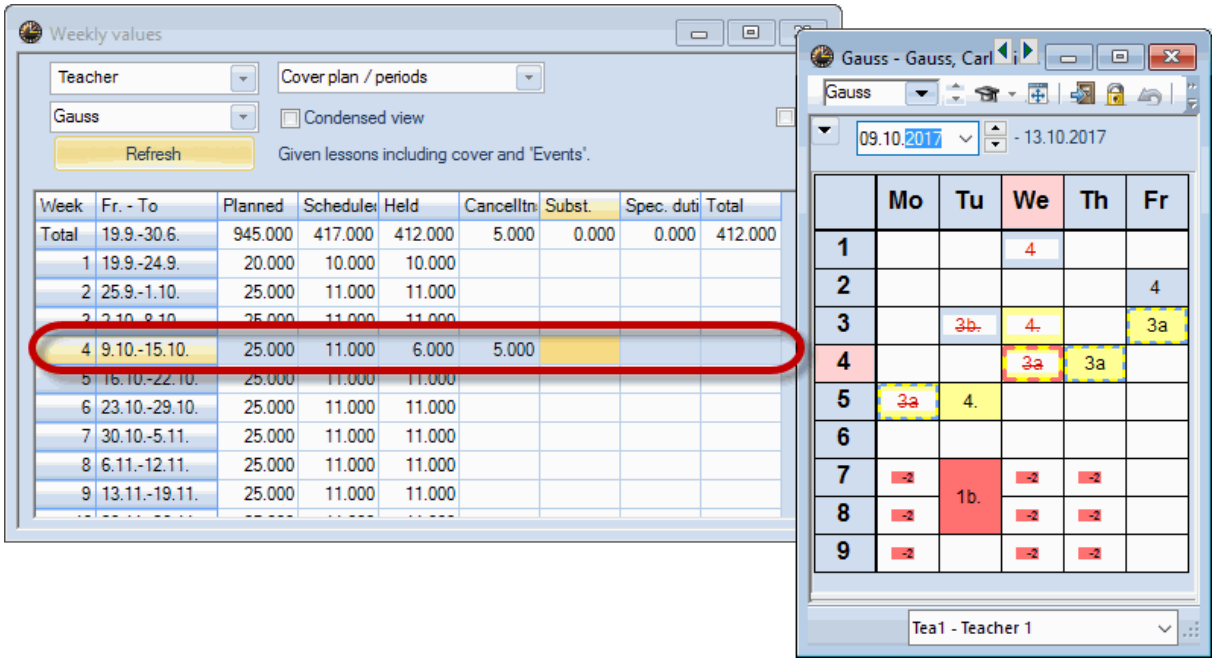
4.1.2.1.5 Cover scheduling / periods

If you work with the 'Cover scheduling' module, this option will display the number of cancelled and substituted periods.



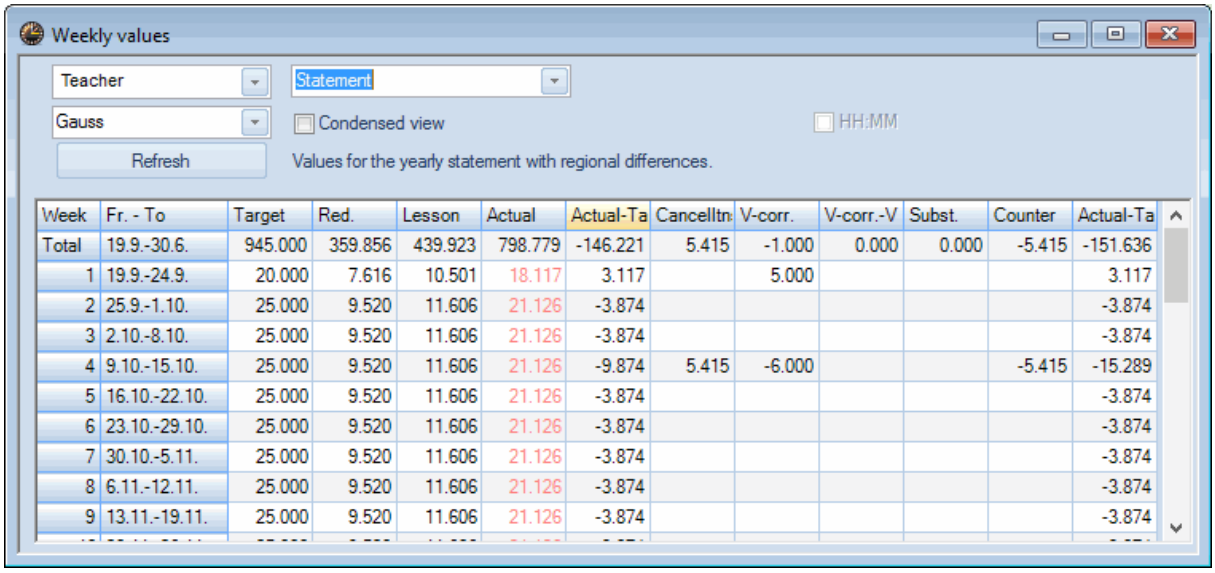
4.1.2.1.6 Cover plan / values

Besides the values for normal lessons, this option also displays the values for substitutions, cancellations and value corrections in cover planning.



4.1.2.1.7 Statement

The statement shows all data for lessons and substitutions in value units.



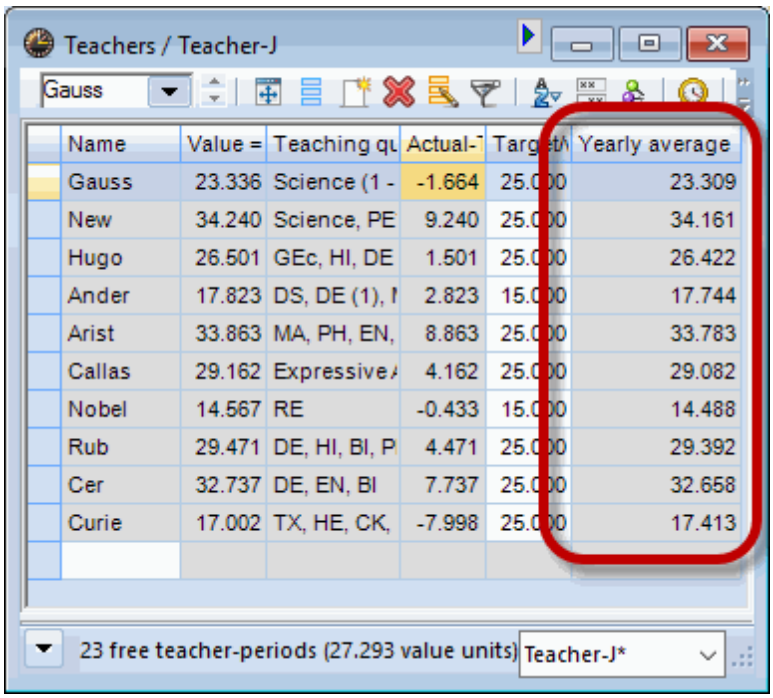
4.1.2.2 Weekly values for classes

The class lists of weekly values have a very similar layout to those the the teacher lists. If you select views with values, they relate to the number of teacher value units that the class in question requires.

4.1.3 Yearly average

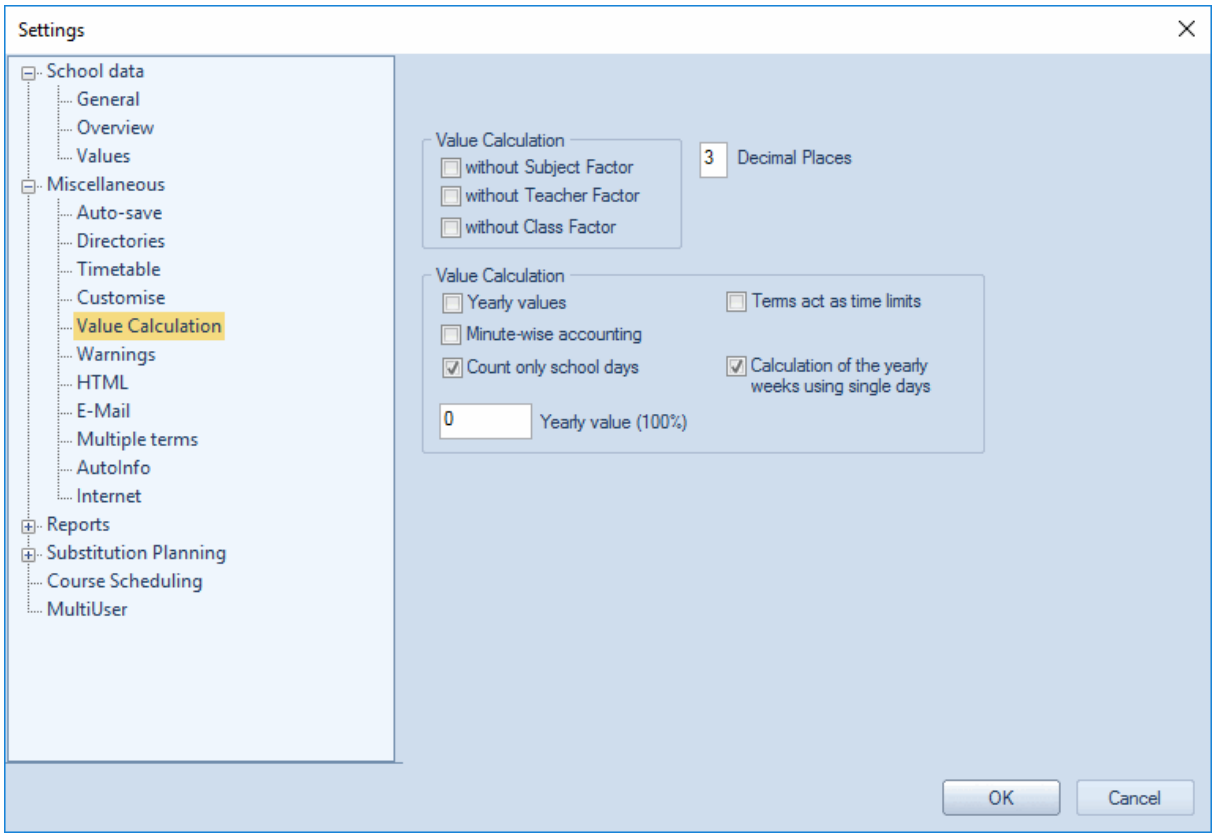
Teacher master data contain the field 'Yearly averages. It shows the average lesson value taken over all terms. You will also find the same value in the ' Lessons / values ' category in the weekly values from the

teacher's perspective.



4.1.4 Value calculation settings

You can find various possibilities to set parameters for value calculation on the 'Value calculation' tab under 'Start | Settings | Miscellaneous'.



- **without Subject Factor , without Teacher Factor , without Class Factor** : You can use these options to override individual factors that you entered in the master data. This means that these factors will no longer be taken into consideration during value calculation.
- **Decimal places** : Here you specify the number of decimal digits (maximum three) with which the values and the various factors in the different views should be displayed.
- **Yearly values** : You can specify whether weekly or yearly values should be displayed.
- **Minute calculation** If you work with different period lengths you can choose to perform value calculation to the exact minute.
- **Count only school days** : Use this option to determine whether all the weeks of a school year should be included in value calculation or just those with at least one day of lessons (i.e. whether school holiday should be included or not).
- **Calculation of the yearly weeks using single days** : This option is only activated if you have checked the 'Count only school days' box. The option results in the number of school weeks in a school year being calculated according to the following formula: (number of school days in the school year) / (number of teaching days in the weekly grid)
- **Yearly value** : This is where you enter the yearly value corresponding to a full year's teaching commitment for a teacher. For example, a value of 900 means that a teacher should teach 900 periods in a year. This option allows you to view - in the teacher master data - the percentage of the teaching commitment that has already been assigned to the teacher. You will find more information on this in chapter 'Percentage factor (yearly values)' .

4.1.5 Reports

Untis allows you to display and print numerous reports in connection with lesson planning and value calculation.

The reports and views described below are associated with the possible entries that are described in this chapter. You can access the reports via 'Start | Reports'.

- Subject/periods report :
- Periods reports

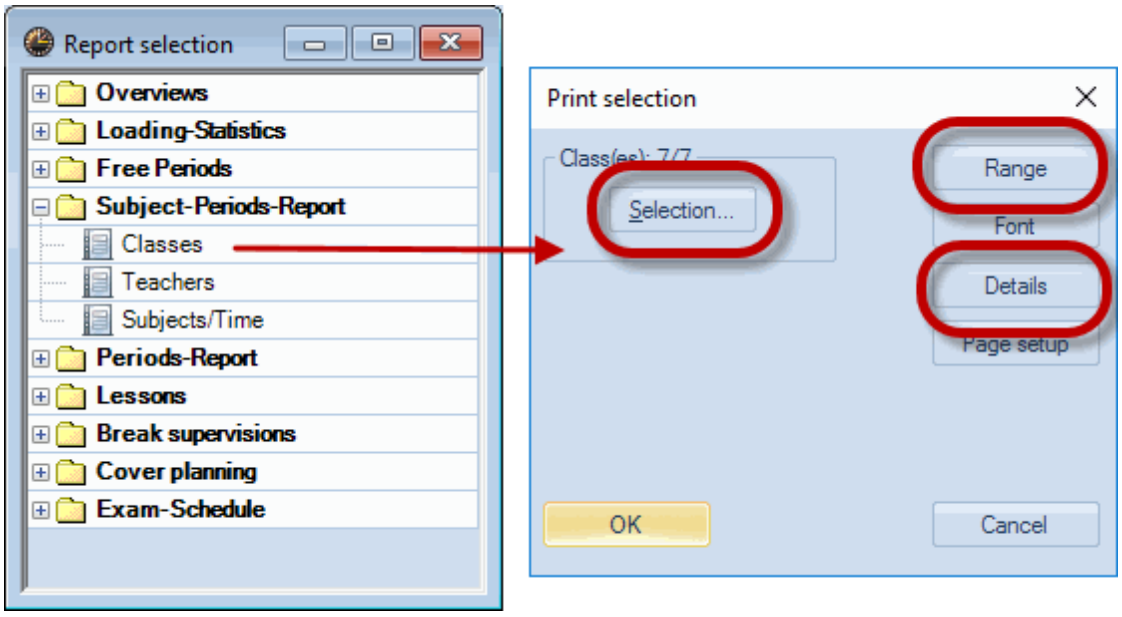
4.1.5.1 Subject / periods reports

Three reports are available in report selection ('Start | Reports') under 'Subjects-period reports' The first two ('Classes' and 'Teachers') are particularly interesting in conjunction with the 'Target per./yr.' option on the 'Values' tab under lessons.

- Classes
- Teachers
- Subjects/time report :

4.1.5.1.1 Classes

Open the list via 'Reports | Selection | Subjects/periods reports | Classes'. The three buttons in the print selection dialogue are explained below:

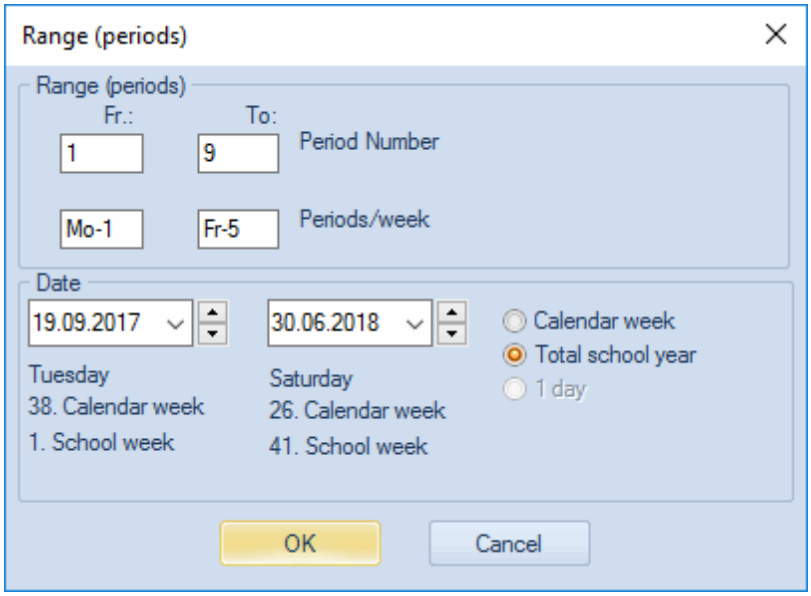


- **Selection** : this is where you choose the elements for which you wish to create the report.
- **Range** this option allows you to define the selection range according to several criteria:

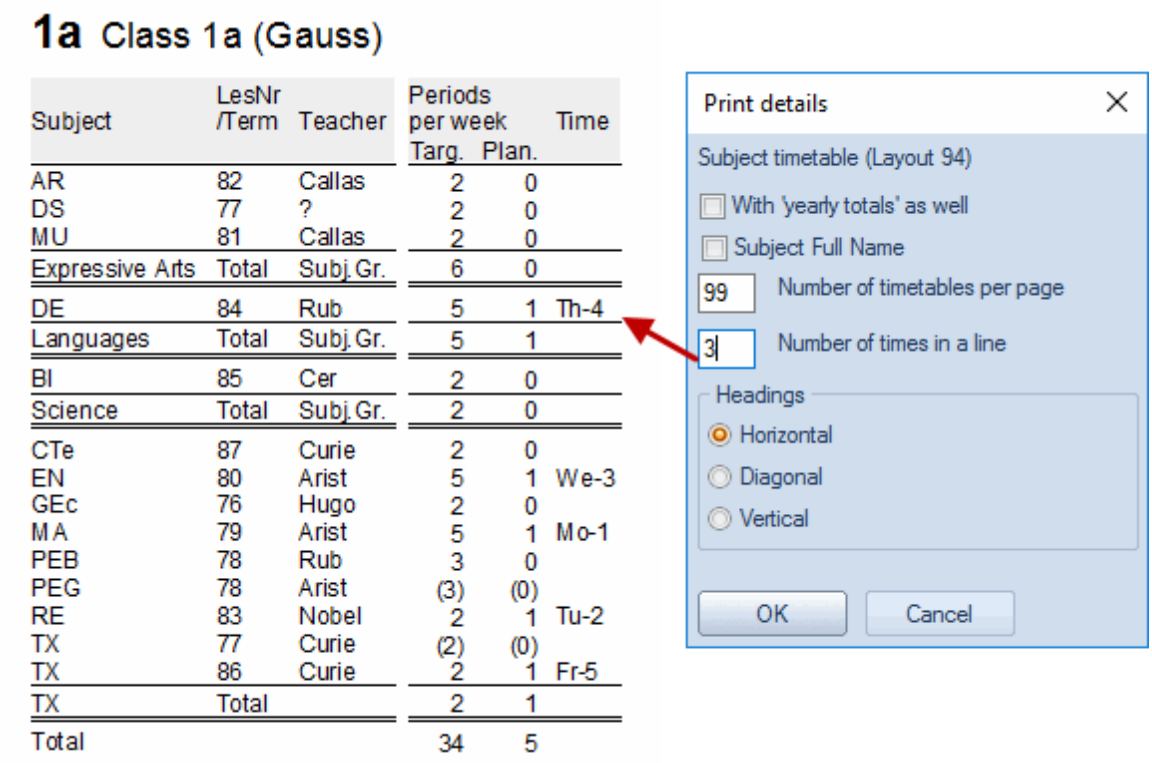
Period number: e.g. only lessons from the 1st to the 4th periods.

Periods/week: e.g. only We-1 to Th-8, only periods on Wednesday and Thursday will be included

Date range: this is where you can select one or several weeks or output the report for the entire school year



- **Details** : besides parameters relating to the layout of the printed report, this option allows you to include an overview of the year.



Note: Yearly overview
You can display a detailed yearly overview as well.

4.1.5.1.2 Teachers

The functions and settings for the teachers report are the same as those for the classes report .

Gauss Gauss

Subject	LesNr /Term	Class	Periods per week Targ.	Plan.	Time
DS	77	1b	2	2	Su-7
Expressive Arts	Total	Subj.Gr.	2	2	
GA	48	3b	1	1	We-3
GA	58	4	2	2	Tu-2, Mo-1
GA	Total		3	3	
Science	Total	Subj.Gr.	3	3	
MA	38	3a	4	4	Th-4, Th-4, We-3, Fr-5
MA	71	4	4	2	We-3, Fr-5
MA	Total		8	6	
Total			13	11	

4.1.5.1.3 Subjects / time report

The subjects/time report shows you when each subject is taught, in which class, in which room and by which teacher.

RE Religious Education

Day	Time	Cla.	Rm.	Tea.	Text
Monday	8:00- 8:45	2b	R2b	Nobel	
Monday	8:55- 9:40	2a	R2a	Nobel	
Monday	9:50-10:35	1b	R1b	Nobel	
Tuesday	8:00- 8:45	3b	Ra	Nobel	
Tuesday	8:55- 9:40	3a	R3a	Nobel	
Tuesday	9:50-10:35	1b	R1b	Nobel	
Tuesday	11:40-12:25	1a	R1a	Nobel	
Wednesday	8:55- 9:40	4	R1a	Nobel	
Wednesday	9:50-10:35	3b	Ra	Nobel	
Wednesday	10:45-11:30	2a	R2a	Nobel	
Friday	8:00- 8:45	2b	R2b	Nobel	
Friday	8:55- 9:40	1a	R1a	Nobel	
Friday	9:50-10:35	4	R1b	Nobel	
Friday	10:45-11:30	3a	R3a	Nobel	

Gruber & Petters Software

4.1.5.2 Periods reports

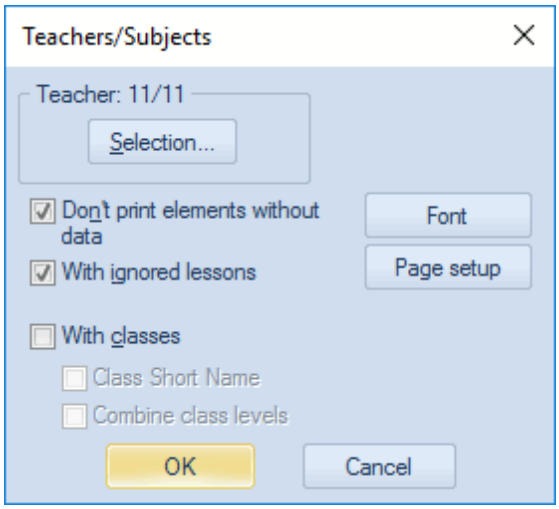
You can access the periods reports under 'Reports| Selection | Periods-reports'. The periods reports offer you three options:

- Teachers/subjects report
- Subjects/teachers report :
- Emergency list

4.1.5.2.1 Teachers/subjects report

This report will display a list for each teacher showing how many subjects and the number of periods taught per week. The value units for the lessons are displayed in a separate column.

You can determine the following settings in the print selection dialogue:



- **Selection** : Clicking on this button allows you to select which elements should be displayed.
- **Don't print elements without data** : If you check this box only those elements will be displayed that are actually included in lessons. For example, if teacher Newton has not been assigned any lessons he will not be output in the teachers/subjects report. If, on the other hand, the box is unchecked, the teacher will appear in the report with 0 periods and 0 value units.
- **With ignored lessons** : On the 'Codes' tab under lessons you have the option of ignoring lessons. Ignored lessons are counted in the calculation but are not scheduled.
- **With classes** : Checking this option results in the report being extended to include classes. The teachers/subjects report will then additionally list for each subject the number of periods the teachers take and the relevant classes. The same applies to the subjects/teachers report.

	Per	Value units
Gauss Carl Friedrich	**13.0**	**13.816**
Mathematics	8.0	8.840
Class 3a (Aristotle)	4.0	4.420
Class 4 (Nobel)	4.0	4.420
Graphics	3.0	3.150
Class 3b (Callas)	1.0	1.050
Class 4 (Nobel)	2.0	2.100
Design	2.0	1.826
Class 1b (Newton)	2.0	1.826

4.1.5.2.2 Subjects / teachers report

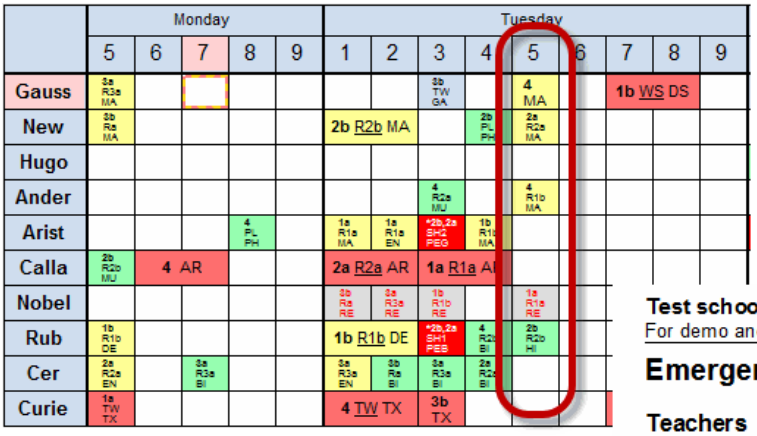
This report displays each subject together with the teachers and the number of periods taught. The value units for the lessons are displayed in a separate column.

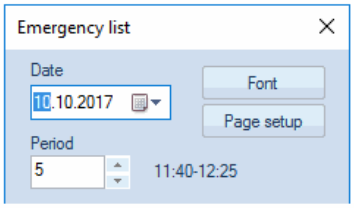
The settings are similar to those of the teachers/subjects list . This is what the subjects/teachers list with classes looks like:

	Per	Value units
Religious Education	**14.0**	**14.679**
Nobel Alfred	14.0	14.679
Class 1b (Newton)	2.0	2.100
Class 2a (Hugo)	2.0	2.100
Class 2b (Andersen)	2.0	2.100
Class 3a (Aristotle)	2.0	2.100
Class 3b (Callas)	2.0	2.100
Class 4 (Nobel)	2.0	2.100
Class 1a (Gauss)	2.0	2.079

4.1.5.2.3 Emergency list

The emergency list creates a list of all classes and teachers present at the system time and date:





Test school DEMO Timetable 2017/2018
For demo and test only Valid from: 10 October

Emergency list 16.10.2017, Period 5: 11:40 - 12:25

Teachers

Teacher	Class	Room	Reason	Text
Gauss Carl Friedrich	3a,	R3a,	L-No. 38	
Newton Isaac	3b,	Ra,	L-No. 56	
Callas Maria	2b,	R2b,	L-No. 30	
Rubens Paul	1b,	R1b,	L-No. 13	
Cervantes Miguel	2a,	R2a,	L-No. 23	
Curie Marie	1a,	TW,	L-No. 86	

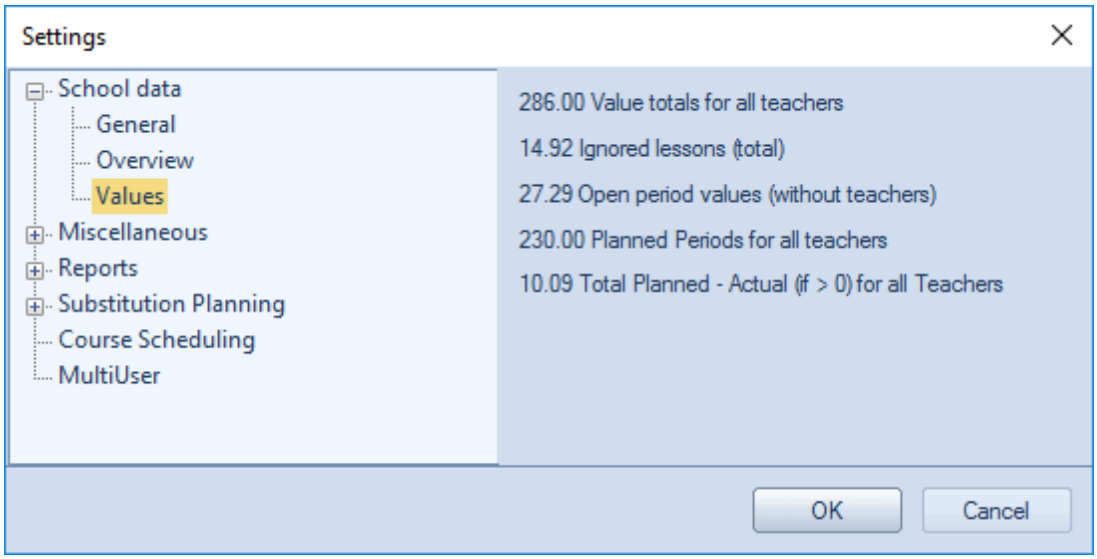
Classes

Class	Teacher	Room	Reason	Text
1a	Curie,	TW,	L-No. 86	
1b	Rub,	R1b,	L-No. 13	
2a	Cer,	R2a,	L-No. 23	
2b	Callas,	R2b,	L-No. 30	
3a	Gauss,	R3a,	L-No. 38	
3b	New,	Ra,	L-No. 56	

You can also call the emergency list direct via 'Start | Reports | Emergency list'.

4.1.6 School data

You can view the following information on the 'Values' tab under the menu option 'Start | Settings | School data':



- **Value totals for all teachers** : This is the total of weekly and yearly values of all teachers entered in the teacher master data.
- **Ignored lessons (total)** : This is the total of all ignored lessons.
- **Open period values (without teachers)** : This is the total of all lessons that have not been assigned a teacher.
- **Planned Periods for all teachers** : This figure represents the total of all planned periods for all teachers.
- **Total planned - actual (if >0) for all teachers** : If a teacher's planned-actual value is greater 0 this means that he/she has not yet fulfilled his/her teaching commitment. This is the total of the planned-actual values of all teachers where this is the case. If this value is 0 then none of your teachers has a workload below his/her contractual target.

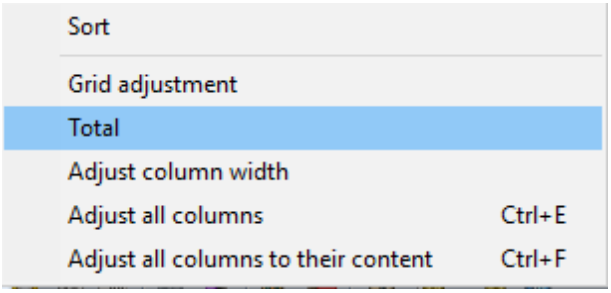
4.2 Examples of value calculation

Examples of value calculation The preceding chapters described the input possibilities associated with value calculation. The following chapters are intended to now use examples to explain how Untis actually calculates the values and how the factors you enter influence the calculation.

- Values from the teacher perspective
- Values from the class perspective

Totals row

If you right-click the column header in the grid display you will see a small menu giving you the option to display a total line.



Lessons: teachers
In the 'Lessons | Teachers' window, the total of the 'Value=' column results from adding the numbers in the coupling rows of the selected teacher.

Lessons: classes
In the 'Classes | Lessons' window, the total of the 'Value=' column results from adding the numbers of **all** coupling rows.

4.2.1 Values from the teacher perspective

Lesson values may be interpreted in different ways depending on the perspective. For example, a period with one teacher and two classes counts as 1 value unit for the teacher, but for each class only 0.5 value units are required for the lesson.

The following ways of influencing value calculation from the teacher perspective are described:

- Factors : You can use factors to rate different lessons in different ways.
- Line value : You can rate different parts of a lesson in different ways.
- Yearly values : You can calculate using absolute yearly values.
- Percentage factor (yearly value) : You can also represent the yearly values as percentages.

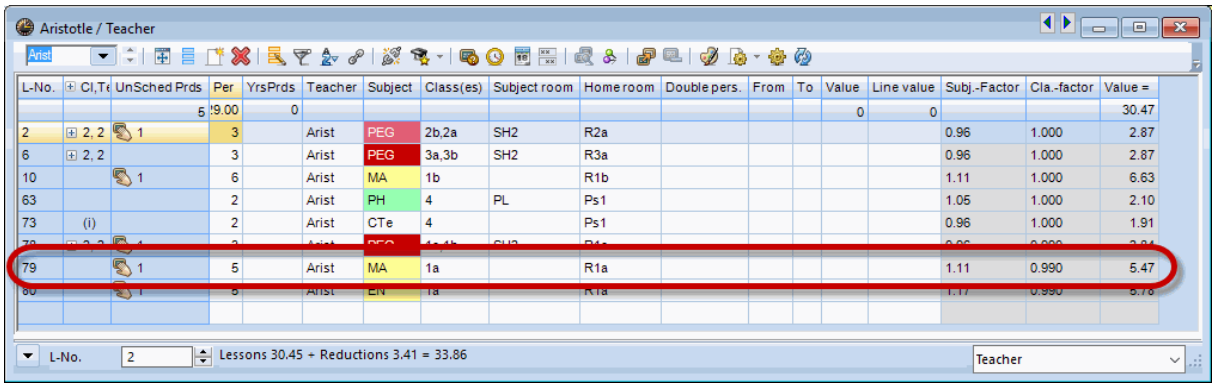
4.2.1.1 Teacher,class and subject factors

For each of the three elements - teacher, class and subject - you can define a factor that is multiplied with the value of a lesson. You can also display the subject and class factors in the lessons window.

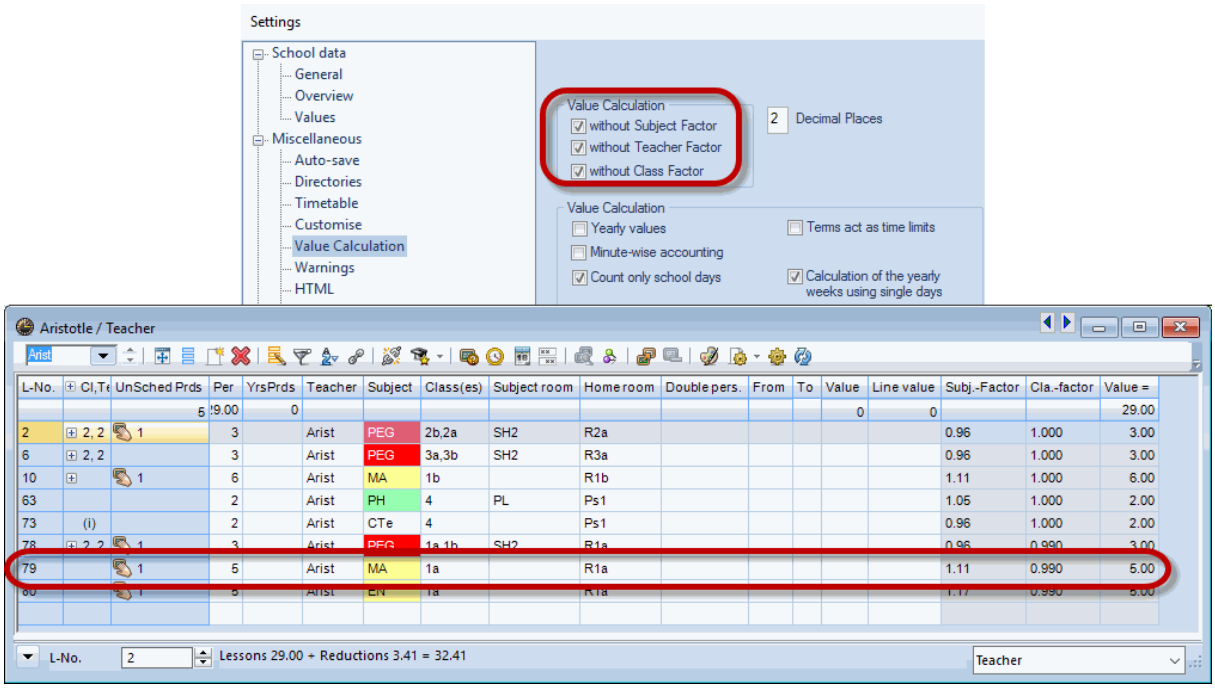
Please open the Demo2.gpn file and select teacher 'Arist' under 'Teachers | Lessons' . Look at lesson number 79.

The lesson has 5.470 value units and is calculated using all the factors from master data.

Weekly periods (5) * teacher factor (1.000) * subject factor (1.105) * class factor (0.990) = 5.470.



If these factors are now ignored, the value for the lessons changes to 5 (number of weekly periods). For this, check the corresponding boxes on the 'Value calculation' tab under 'Settings | Miscellaneous'.



4.2.1.2 Line value

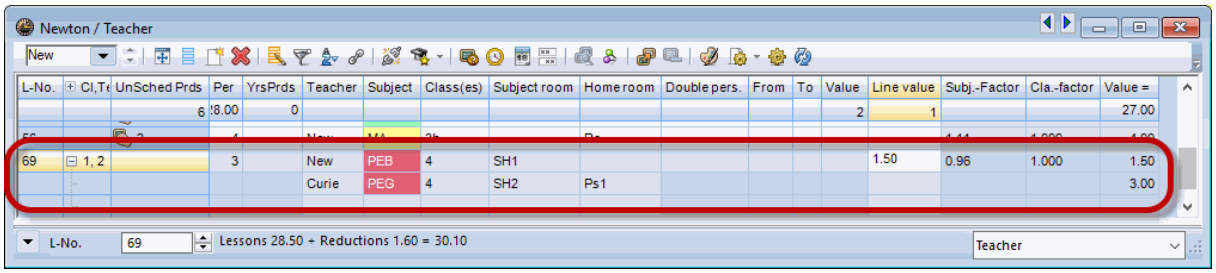
A lesson with a lesson number is regarded as a coupling even when several teachers are involved in it. Nevertheless, you can rate the lessons of the teachers involved in different ways by entering fixed values or factors in the 'Line value' column.

Example

Please open the Demo2.gpn file and look at lesson number 69. Teachers Newton and Curie together take class 4 for PE for three periods.

In this example, teacher Newton is a supply teacher and for this reason his lesson may only be valued with the fixed value of 1.5. Please enter the value 1.5 into the 'Line value' columns of the coupling row for teacher Newton.

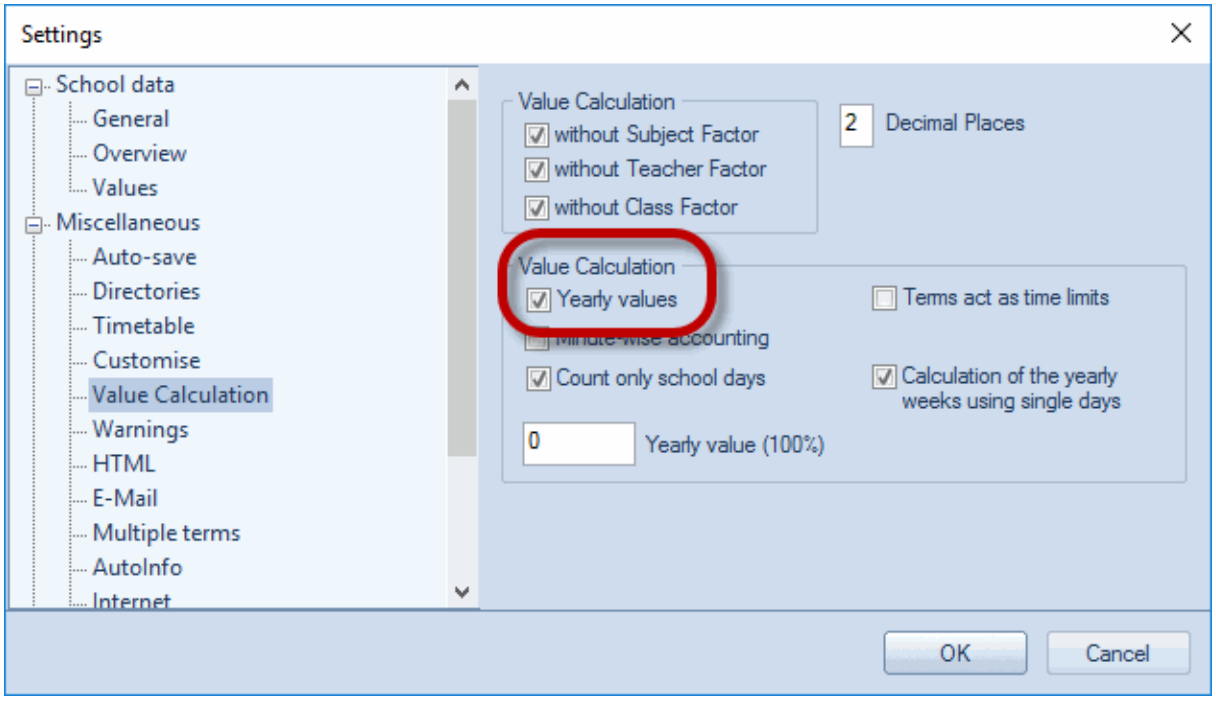
You see that the lesson value for teacher Curie is 2.865 (which is the product of weekly periods and subject, class and teacher factors) while the fixed line value of 1.5 has been accepted for teacher Newton.



Note: Input in the line value column
You can influence the line value using the same types of input (fixed value, factor or summand) that were described in the chapter on examples for lesson values.

4.2.1.3 Yearly values

As already mentioned, Untis can display not only the weekly values for a lesson but also yearly values. In order to do this, select the option 'Yearly Values' on the value calculation tab under 'Start | Settings | Miscellaneous'.



The values that now appear in the 'Value=' column are calculated as follows: (value=) = (factors) * (weekly periods) * (number of weeks in the year)

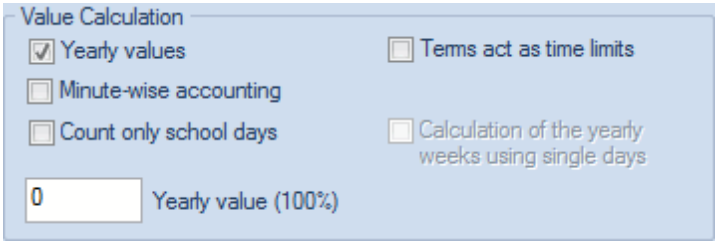
Warning:
It must again be stressed that for value calculation all weeks in which lessons can theoretically take place have the same value irrespective of whether they have school-free days or not.

There are three ways to calculate the number of weeks per year:

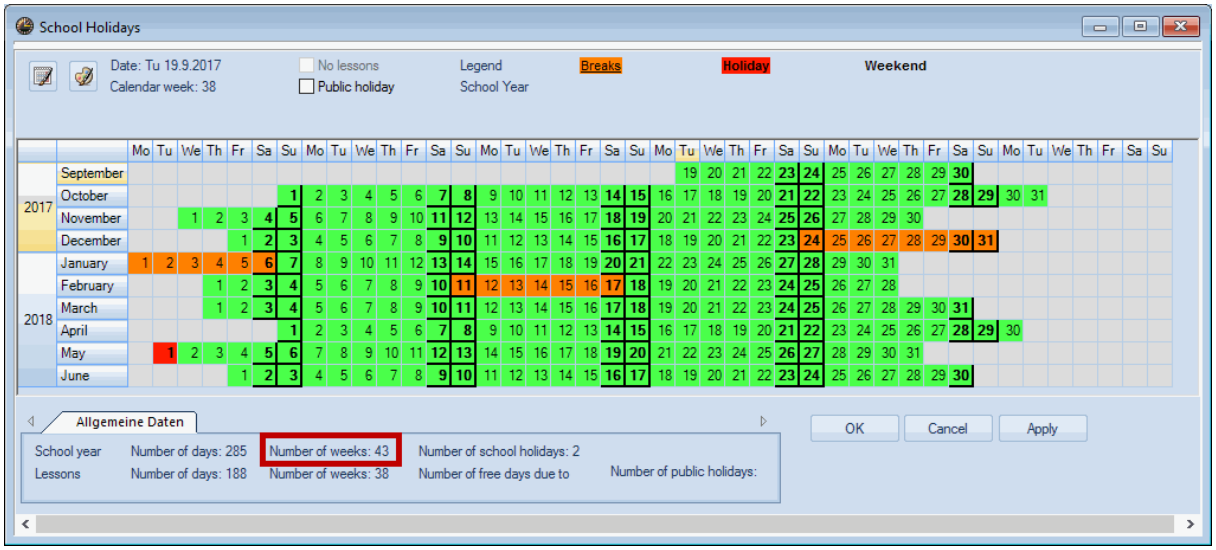
- All weeks
- All weeks excluding holidays
- Calculate from individual days

4.2.1.3.1 All weeks

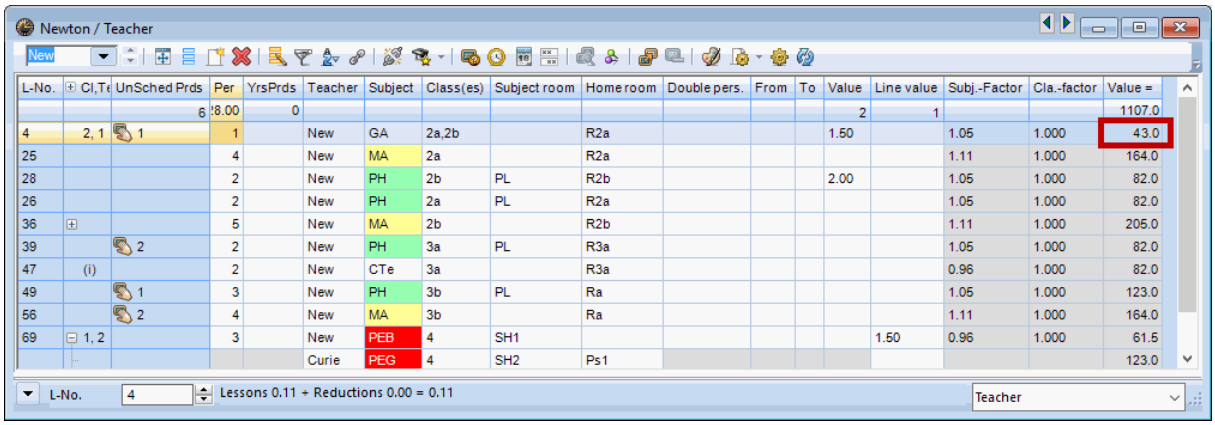
The settings under 'Start | Settings | Miscellaneous' on the 'Value calculation' tab must be as follows:



All weeks in the school calendar will be counted, in this example 43.

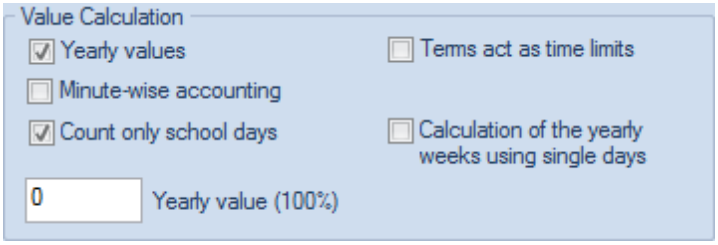


The yearly value for Newton's one period, lesson number 4, is therefore also 43.

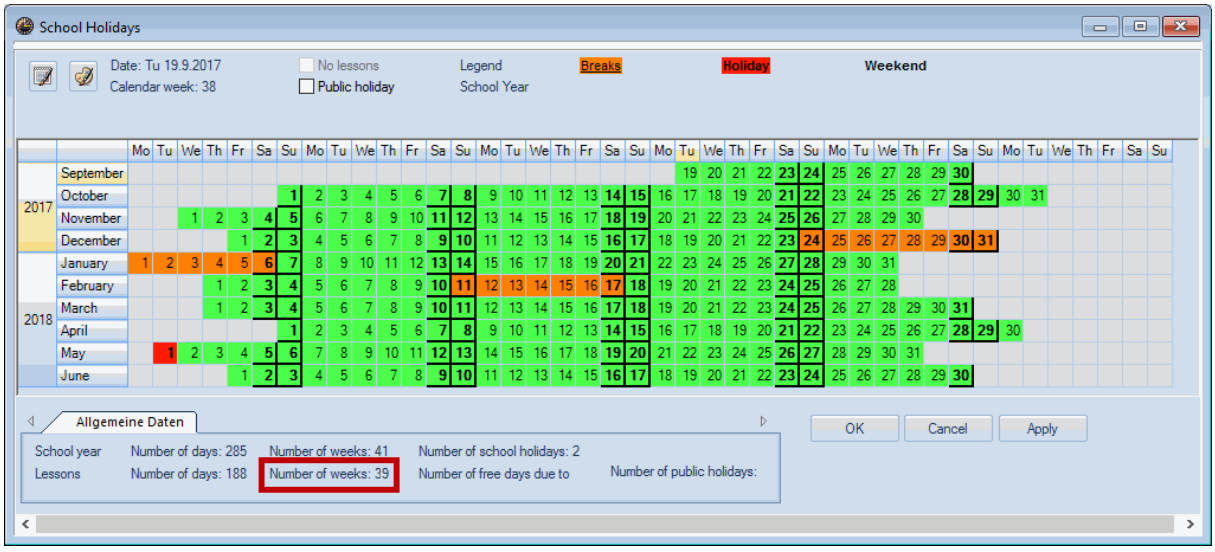


4.2.1.3.2 All weeks excluding holidays

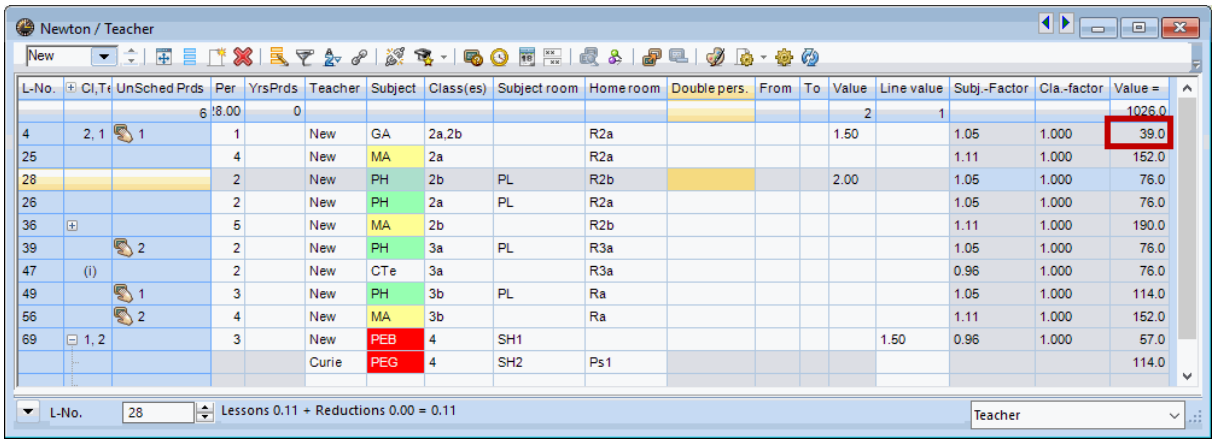
The settings under 'Start | Settings | Miscellaneous' on the 'Value calculation' tab must be as follows:



Only those weeks are counted in which lessons are held on at least one day per week. This excludes the four weeks of holiday in December, January, February and April meaning that 39 weeks are counted.

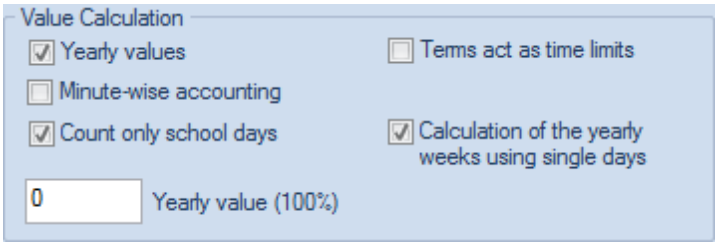


The yearly value for Newton's one period, lesson number 4, is therefore also 39.



4.2.1.3.3 Calculating from individual days

The settings under 'Start | Settings | Miscellaneous' on the 'Value calculation' tab must be as follows:

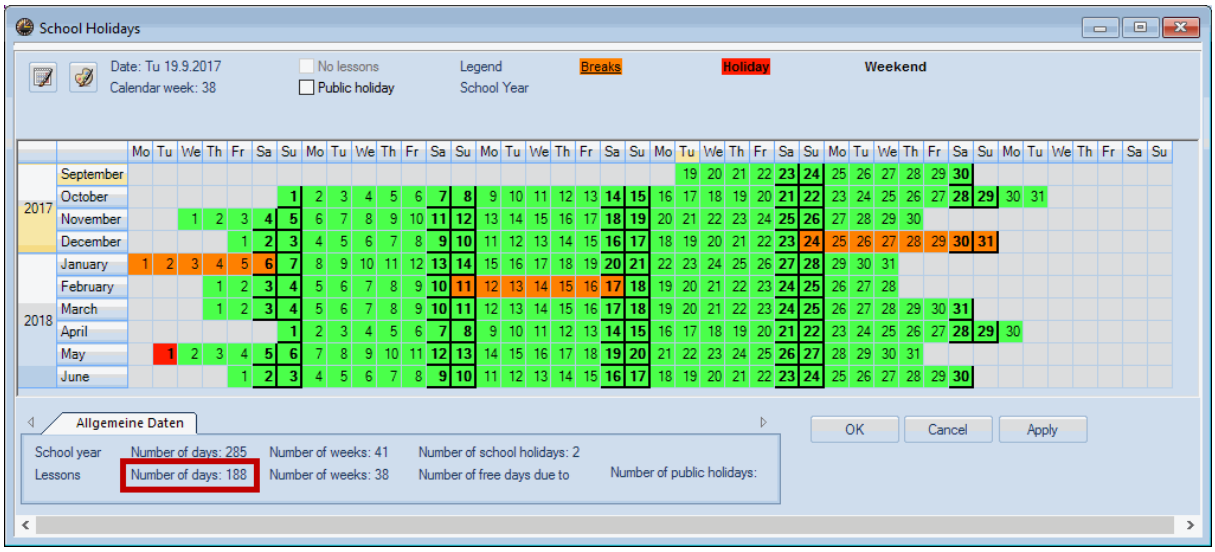


The number of weeks is calculated as follows:

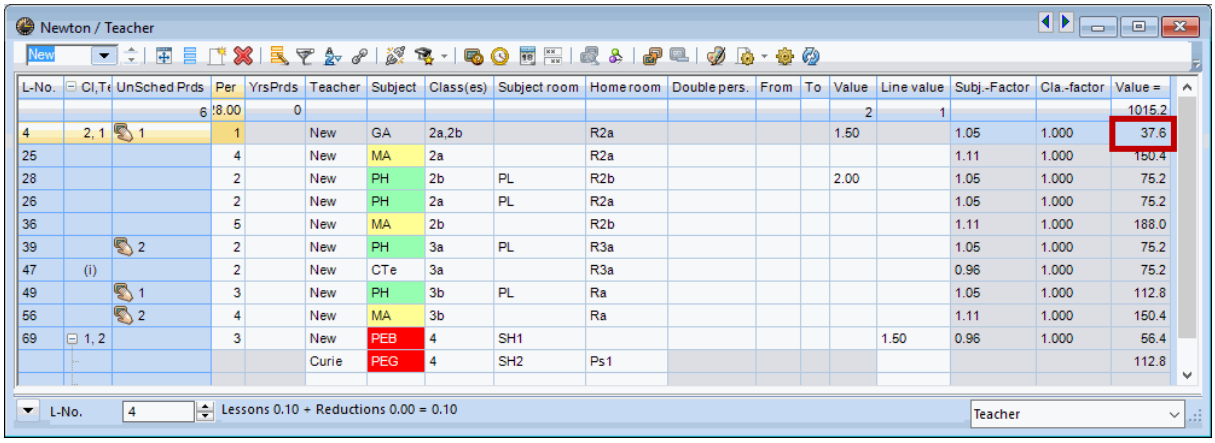
(number of days on which lessons are held) / (number of teaching days per week) = (number of weeks)

In this example lessons are held on 188 days of the school year and on 5 days per week, resulting in the following calculation:

188 / 5 = 37.6



The yearly value for Newton's one period, lesson number 4, is therefore also 37.6.



4.2.1.4 Percentage factor (yearly value)

Some schools are not so interested in how many periods a teacher takes but in the proportion of the planned lessons taught.

You can enter the value corresponding to a teacher's full teaching commitment, i.e. 100%, in the field 'Yearly value (100%)' on the 'Value calculation' tab under 'Start | Settings | Miscellaneous'. This value is only used when the 'Yearly values' box has also been checked.

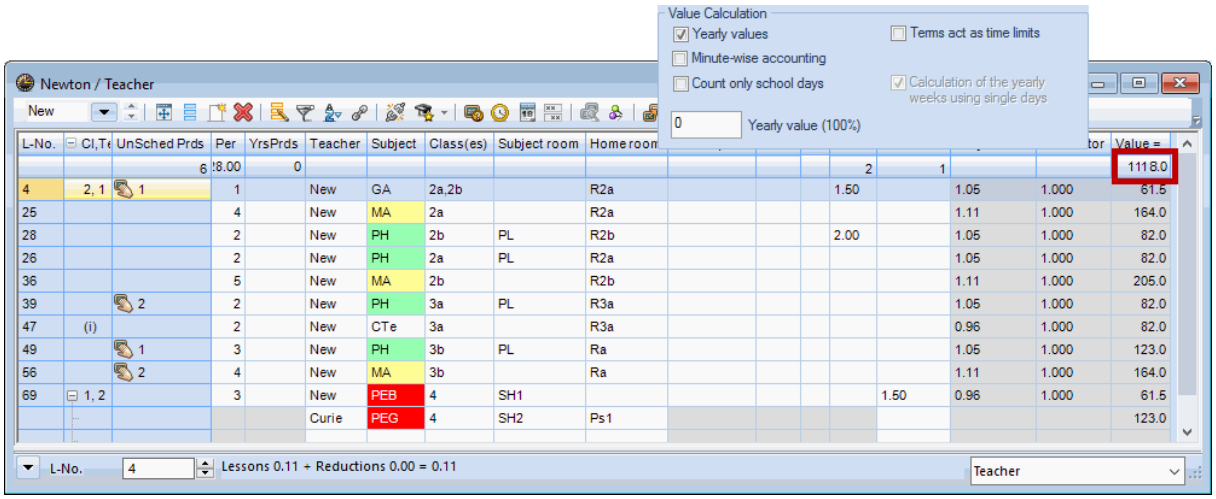
The lessons window now no longer displays the current yearly value; instead it displays the percentage of the current teaching compared with the yearly value.

You can easily see from the totals line whether a teacher is underemployed or overemployed

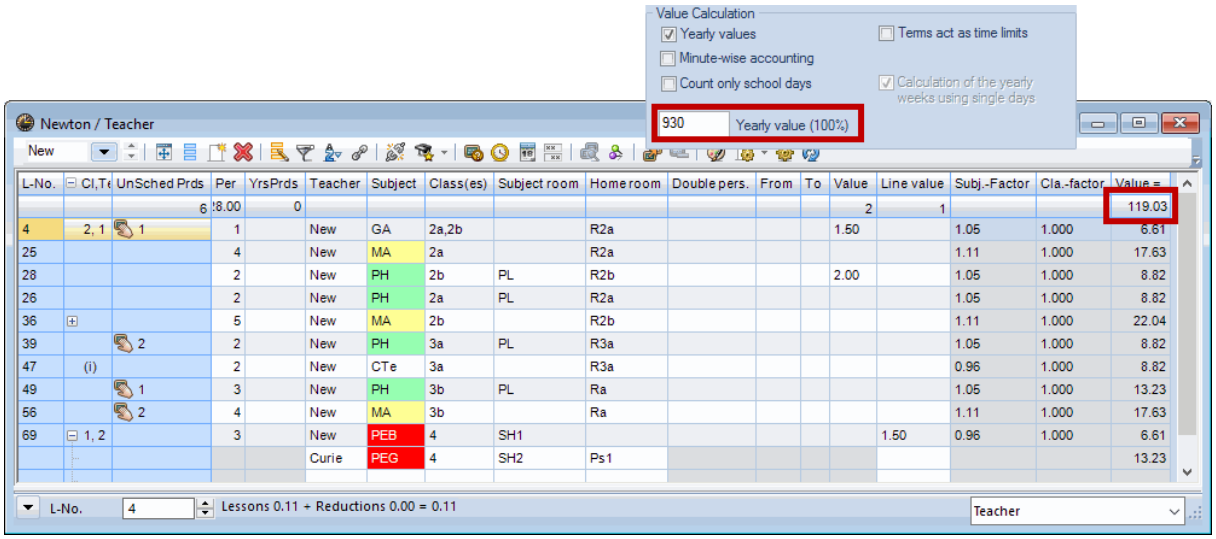
Note: Totals line
You can display the totals line by right-clicking on the table heading in the lessons window.

Example: Percentage factor (yearly value)

Teacher Newton achieves a yearly value of 1118.0 with the lessons he takes.



If you now specify a yearly value of e.g. 930, you will see that the total number of lessons for Newton is now 114.4. This would mean that he would be teaching 14.4 % more than called for by his full teaching commitment.

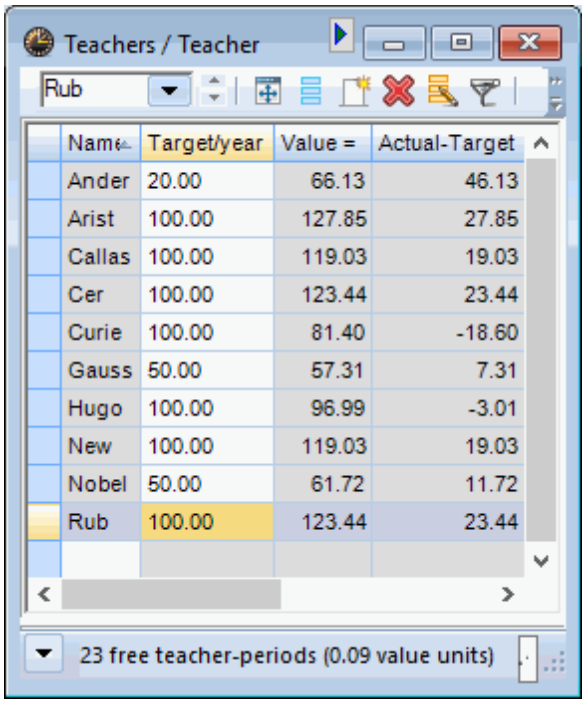


Part-time teachers

If you now enter the teaching commitment as a percentage in the 'Target/year' field under 'Teachers | Master Data' (a full-time teacher commitment corresponds to 100%), the 'Actual-plan' entry (the

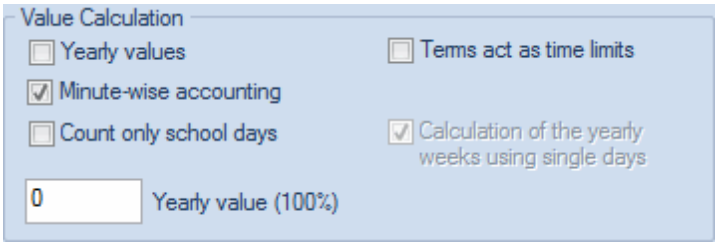
difference between the actual and the desired value) will be updated.

In some Scandinavian countries it is usual to employ part-time teachers on the basis of a percentage of a full teaching commitment. The figure on the following page shows teacher Andersen defined as a part-time teacher with 20% commitment and teachers Gauss and Nobel with 50% commitments. The yearly percentage factor makes it possible to see at a glance what percentage of the target workload has been assigned.



4.2.1.5 Minute calculation

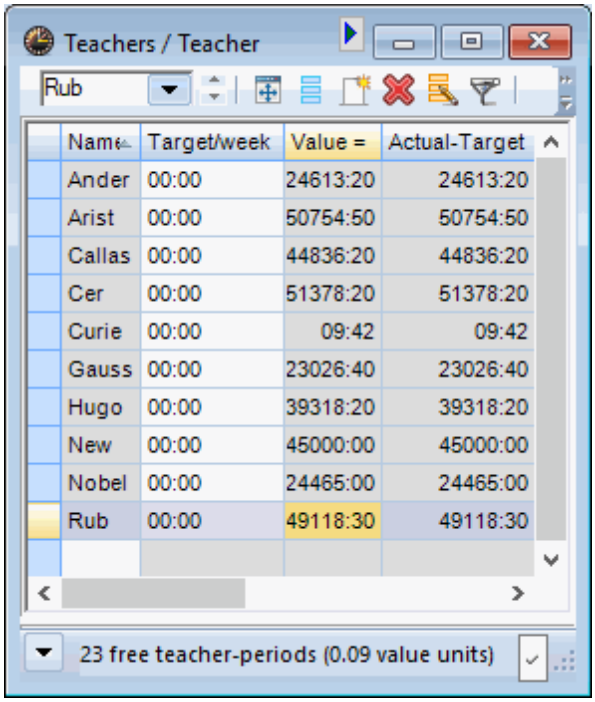
Value calculation can be performed to the exact minute. To do this, check the option 'Minute calculation' under 'Start | Settings | Miscellaneous' on the 'Value calculation' tab.



The 'Target/week', 'Value=' and 'Actual-planned' fields in the teacher master data will not be filled with hours and minutes.

Warning: Unscheduled periods
Unscheduled periods will not be included in the calculation of minutes since they cannot be assigned a

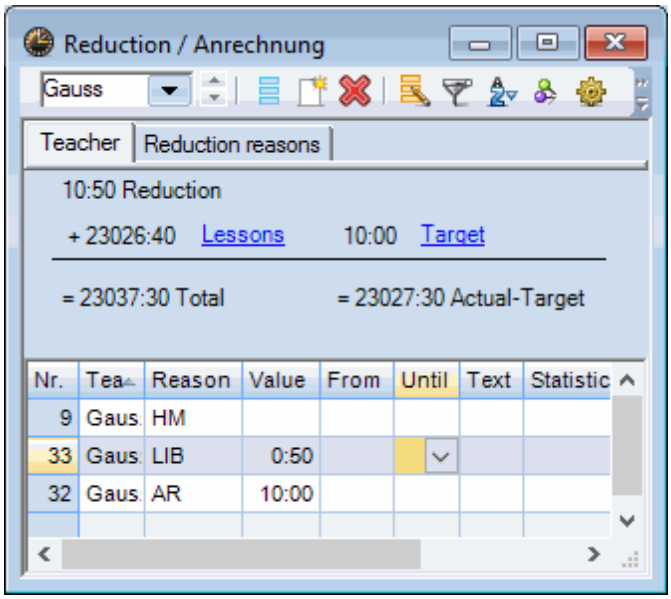
duration (since the time grid allows each lesson to have a different duration).



Note:
Any entries previously made in the 'Target/week' field will not be lost. The entries will be active once more when you uncheck the option 'Minute calculation'.

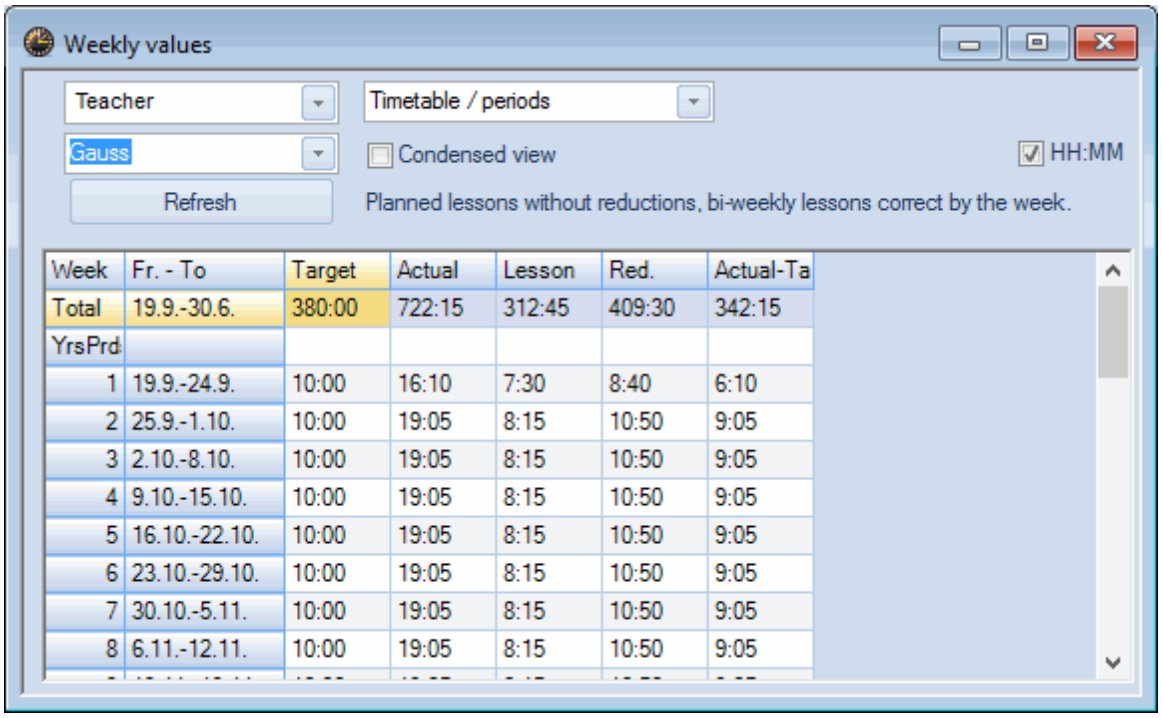
Reductions

Reductions will also be displayed exactly to the minute. The figure shows that teacher Gauss is given 10 fewer hours owing to his age. He also spends 50 minutes a week looking after the library.



Weekly values

It is possible to switch between 'Timetable | Hours' and 'Substitution plan | Hours' in the weekly values. All values will be calculated exactly to the minute.

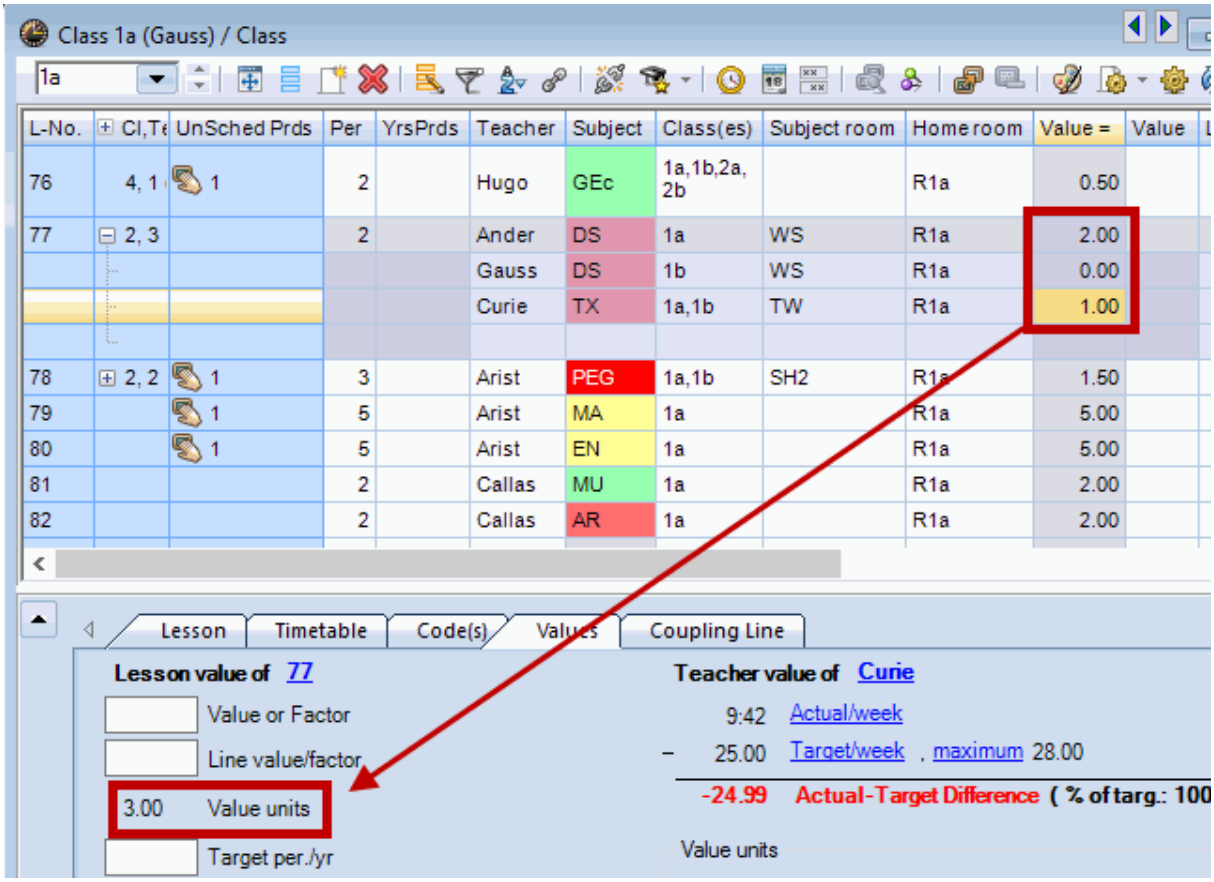


Week	Fr. - To	Target	Actual	Lesson	Red.	Actual-Ta
Total	19.9.-30.6.	380:00	722:15	312:45	409:30	342:15
YrsPrd						
1	19.9.-24.9.	10:00	16:10	7:30	8:40	6:10
2	25.9.-1.10.	10:00	19:05	8:15	10:50	9:05
3	2.10.-8.10.	10:00	19:05	8:15	10:50	9:05
4	9.10.-15.10.	10:00	19:05	8:15	10:50	9:05
5	16.10.-22.10.	10:00	19:05	8:15	10:50	9:05
6	23.10.-29.10.	10:00	19:05	8:15	10:50	9:05
7	30.10.-5.11.	10:00	19:05	8:15	10:50	9:05
8	6.11.-12.11.	10:00	19:05	8:15	10:50	9:05

4.2.2 Values from the class perspective

We have so far considered values from the teacher perspective. From the class perspective different values can result for coupled lessons depending on the configuration and extent of the coupling.

The value displayed in the grid view corresponds to the total of the values in all coupling lines of the lesson in question.



Warning: Time limitations and lesson groups
Time limitations of classes or their membership in lesson groups that you can define using the multi-week timetable module have an effect on the values described below.

The values are first described without factors , and the factorsare then included.

4.2.2.1 Without factors

We will be looking at the Demo2.gpn file and the two relevant possibilities for coupling:

- Only one teacher involved (class coupling)
- Several teachers involved

In both cases, allfactorsare deactivated ('Settings | Miscellaneous', 'Value calculation' tab).

4.2.2.1.1 One teacher involved

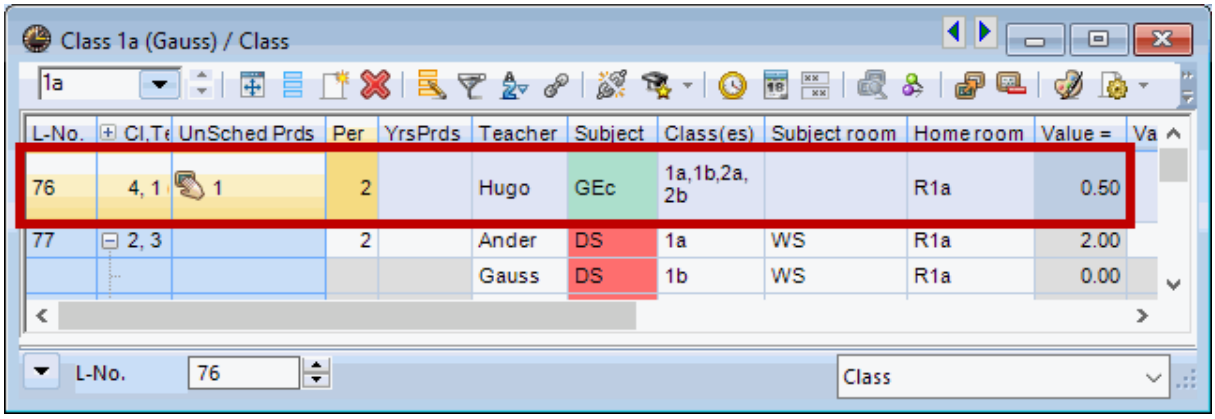
Teacher Hugo takes a total of four classes for lesson number 76. This means that each class 'uses' a quarter of the teacher. For this reason the lesson with two weekly periods has a value of 0.5 from the perspective of class 1a

The situation can be calculated as follows:

(number of weekly periods) / (number of classes) = (value)

Using the example of lesson 76, this would be:

2 / 4 = 0.5

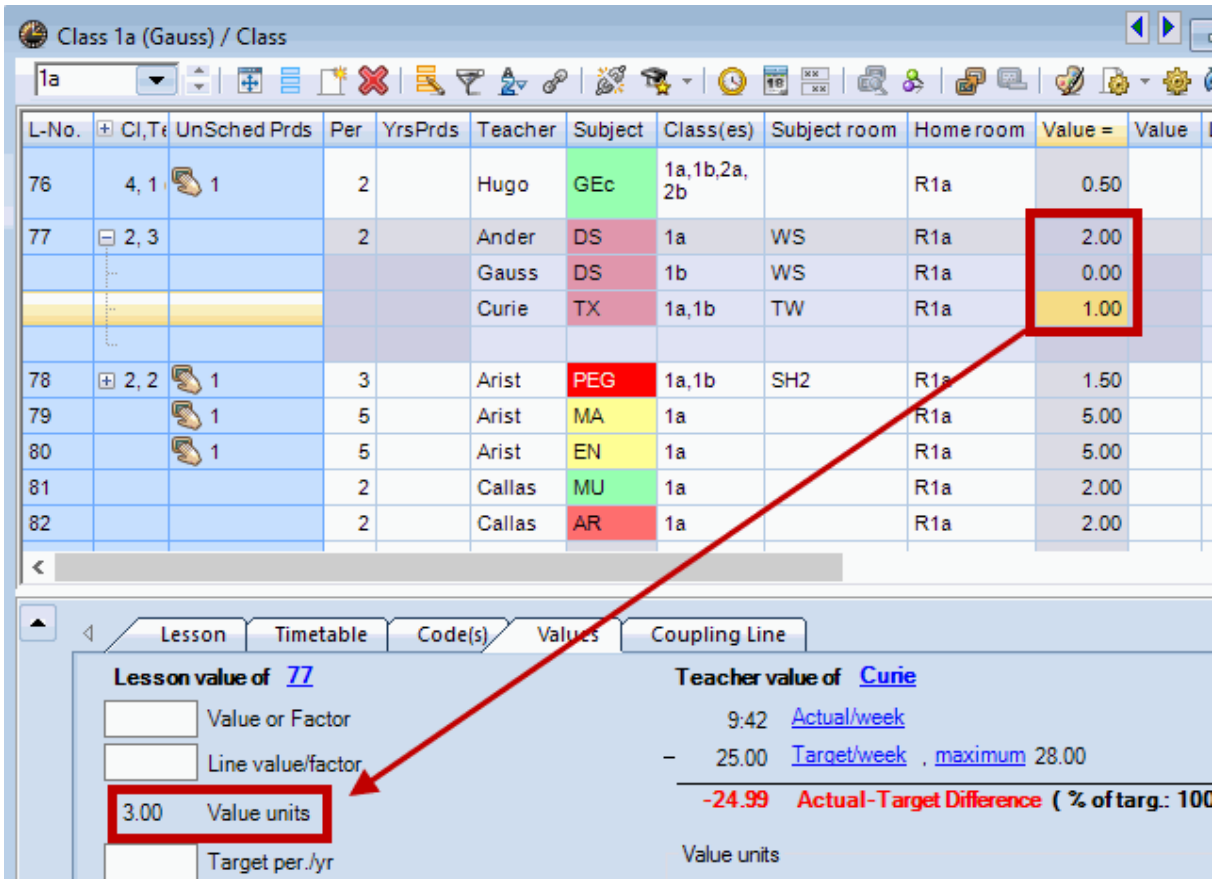


4.2.2.1.2 Several teachers involved

When several teachers share a coupled lesson, the value for each coupling line is calculated as for one teacher , and these values are then added together.

Warning: Class not in coupling line
If the class in question is not in a coupling line, the value of the coupling line will be 0.

Example: Value of lesson 77 for class 1a



- First coupling line, teacher Ander

Two weekly periods for a class, the value is 2.000.
2 / 1 = 2

- Second coupling line, teacher Gauss

Class 1a is not included in this coupling line, the value is 0.000.

- Third coupling line, teacher Curie

Two weekly periods for two classes, the value is 1.000.
2 / 2 = 2

- Total value for lesson 77

The total value for the lesson is the sum of the coupling lines, i.e. 3.000
2 + 0 + 1 = 3

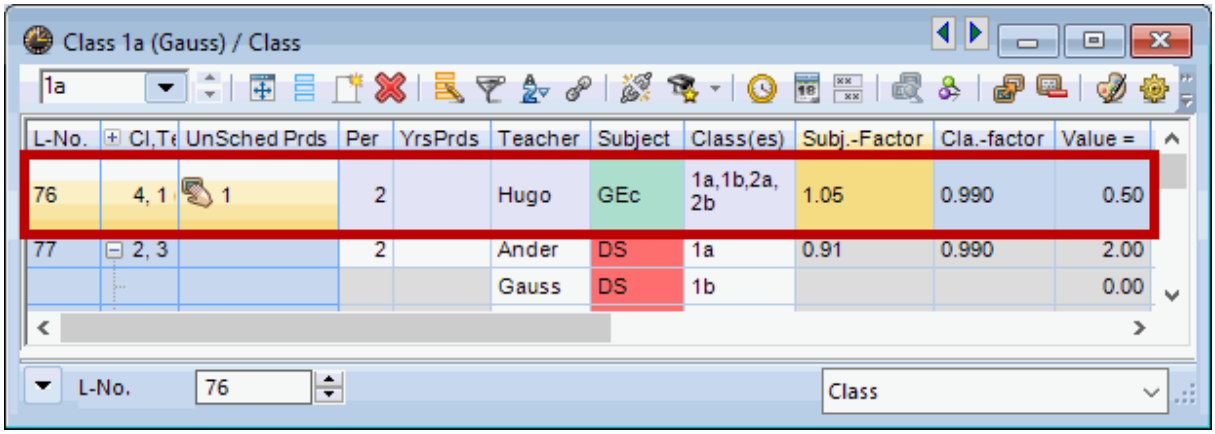
4.2.2.2 With factors

If you now wish to use teacher, class and/or subject factors, the values mentioned above will just change by being multiplied with the relevant factors.

Lesson number 76 will be used as an example to illustrate how class, teacher and subject factors are

taken into account.

This results in the following value:
2 (weekly periods) / 4 (number of classes) * 1.050 (subject factor) * 0.990 (class factor) = 0.520



4.3 Value calculation - multi-week timetable

The multi-week timetable module enables you to put date limits on lessons in a variety of ways. This has a considerable effect on value calculation, as the examples on the following pages demonstrate.

Warning: Calculation
Value calculation is relevant at a time when no lesson scheduling has taken place (e.g. when assigning subjects). Calculations use the number of weeks in which lessons can generally be scheduled, i.e. all weeks in which lessons can take place on at least one day. It is of no importance how many school-free days occur in such a week.

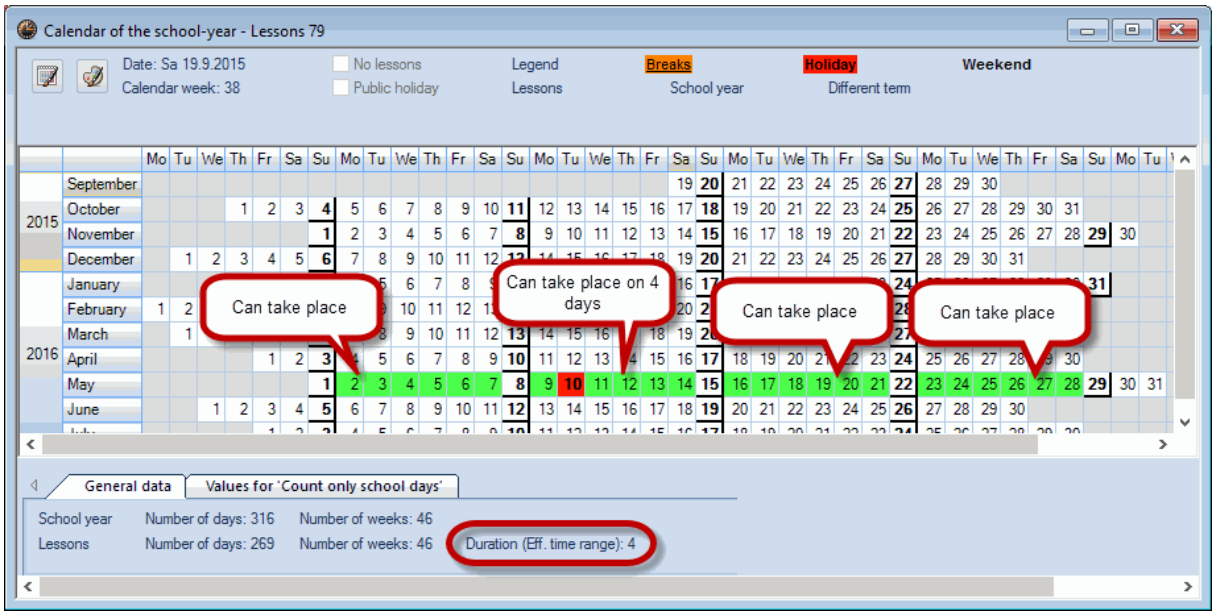
The following methods of putting time limits on lessons are discussed:

- Date time limitations
- Lesson groups
- Terms

Note: 2015/2016 school year
All the following examples were calculated for the 2015/2016 school year. For time limitations the turn of the year can have major consequences. A time limitation that in one school year lasts from Monday to Friday can in the next school year - if the 'from' and 'to' dates remain the same - last for example from Friday to Tuesday. Value calculation would calculate in the first case with one week and in the second case with two. This would result in different values for different school years.

4.3.1 Date time limitation on lessons

The following figure shows the school-year calendar for a lesson that is limited to the period 2 May to 29 May. 10 May is a public holiday (marked red). You can call the calendar for the school year using the appropriate toolbar icon in any lessons view.

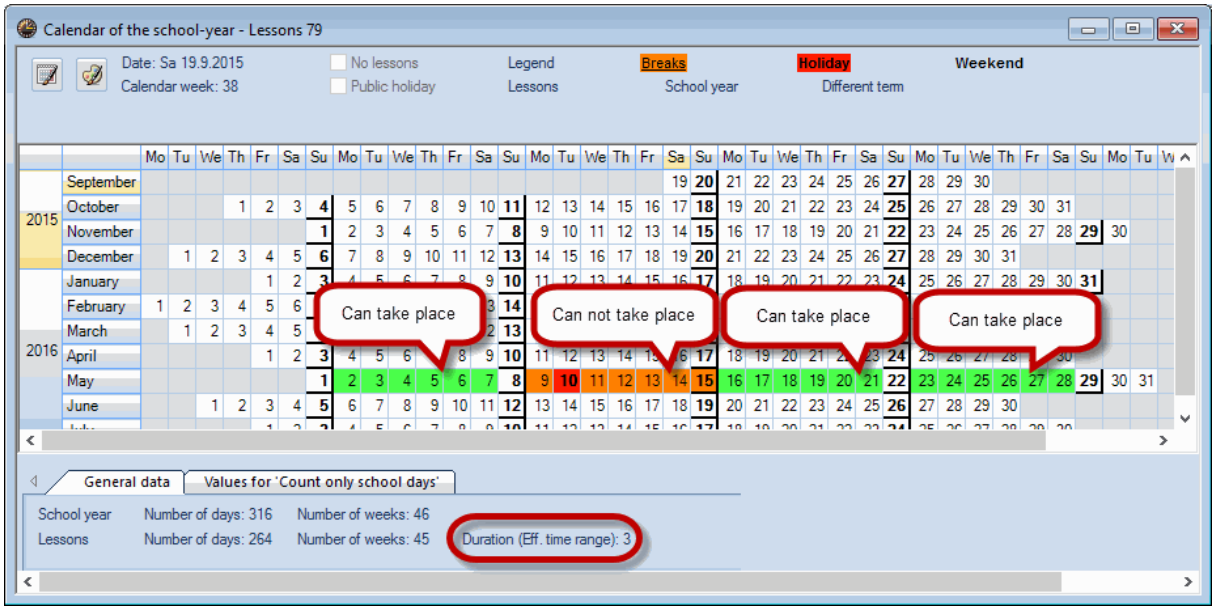


Despite the public holiday there is still the possibility that the four periods of this lesson could be held as they could be scheduled for one of the other days.

This can be seen from the entry 'Duration (<ke>Eff. time range)' on the 'General data' tab. This shows the number of weeks in the time period in which at least one day of lessons can be held. In this case 4, in spite of the public holiday.

With holidays

If there were a week's holiday within the time limitation period, e.g. from 9 May to 15 May, this possibility would no longer exist. In this case, the lesson could only take place three times within the time limitation period.



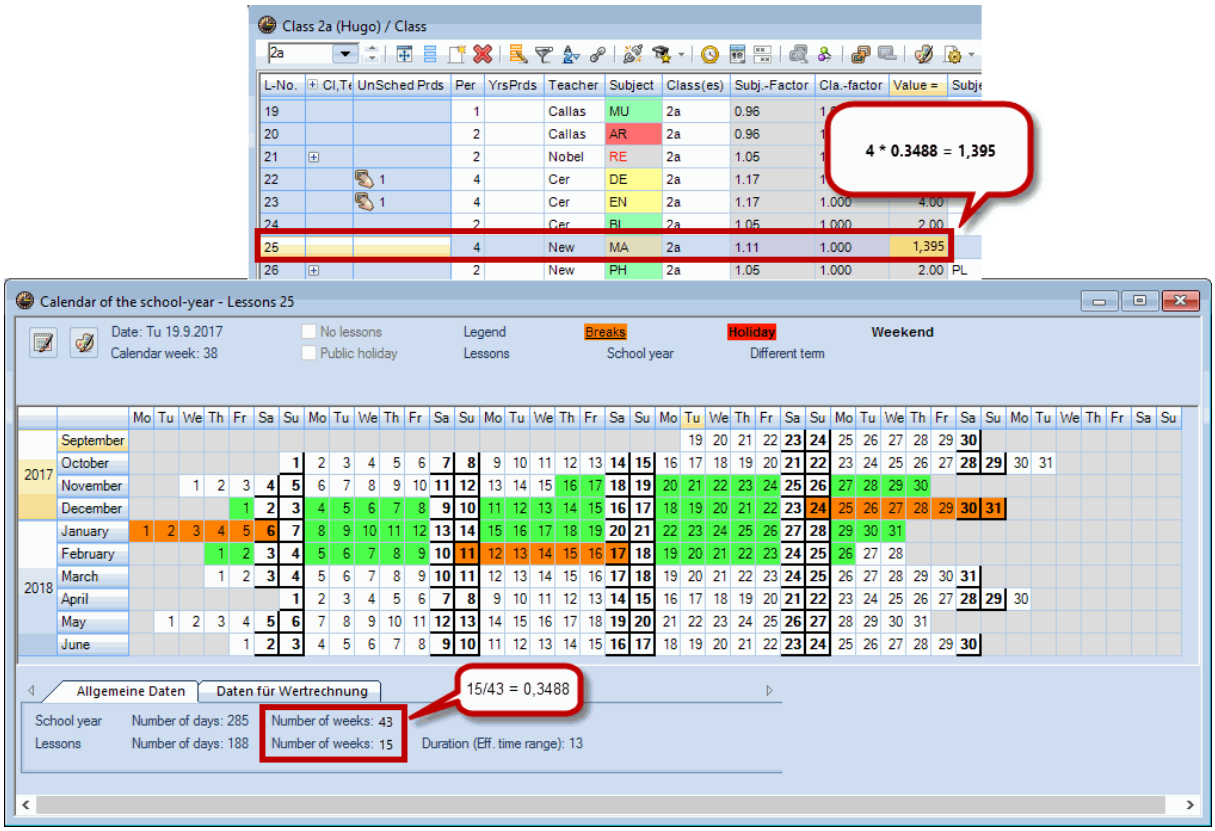
You can determine for yourself whether or not holiday weeks should influence value calculation by using the'Count only school days' option on the 'Value calculation' tab under 'Start | Settings | Miscellaneous'.

The information on the tabs 'Value calculation' and 'Values for count only school days' in the school year calendar is useful for understanding the individual calculations.

4.3.1.1 Value calculation with time limitations

The following example shows how values are calculated if lessons are date-limited. Please look at lesson number 25 in the Demo2.gpn file. The factors in the master data should not be taken into consideration and lessons should take place between 18 November and 28 February.

In these circumstances a value of 1.395 results. Looking at the school year calendar you can recognise how this value was calculated.



The school year extends over a period of 43 weeks (including holidays). However, there are only 15 weeks available for lessons. Dividing one value by the other (total weeks / lesson weeks) gives a distribution time factor that is used to multiply the value of the lesson.

The following calculation is performed: 4 * 15 / 43 = 1.395

School days only

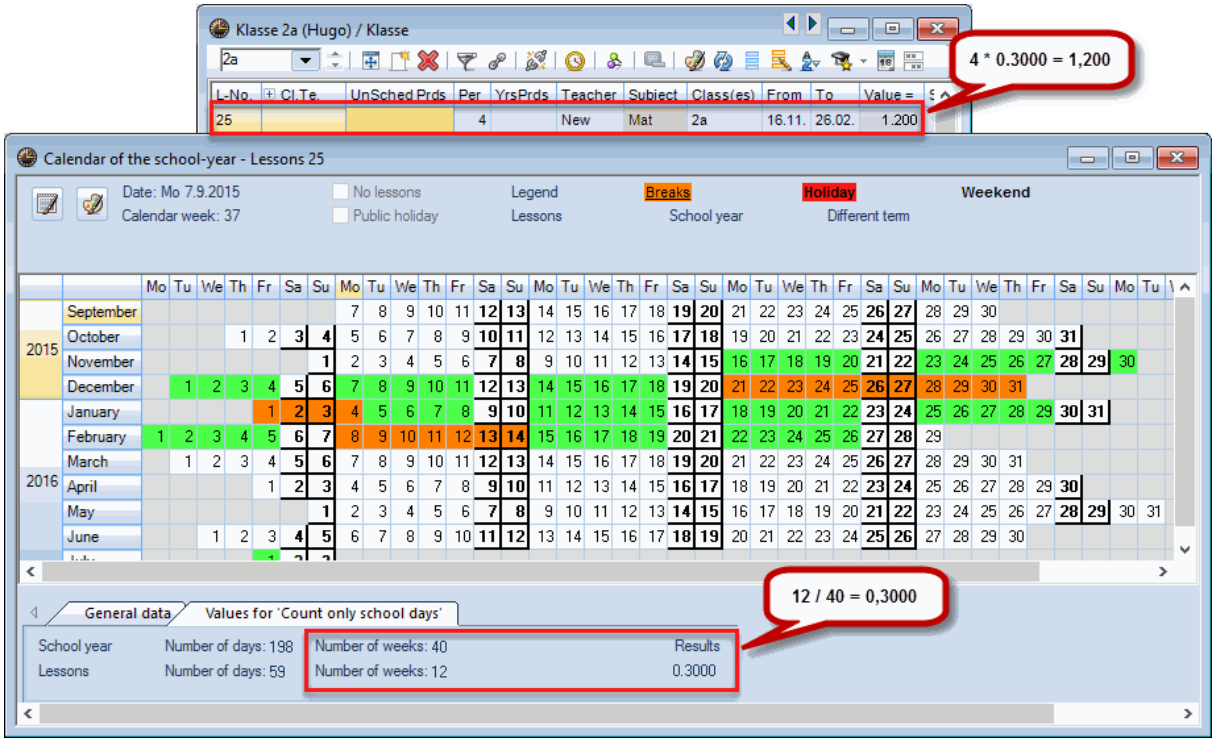
As already mentioned, this calculation included weeks with school holidays. If you wish to exclude this

you can also activate the 'Count only school days' option on the 'Value calculation' tab under 'Start | Settings | Miscellaneous'.

Doing this means that only those weeks are included in the calculation in which lessons occur on at least one day.

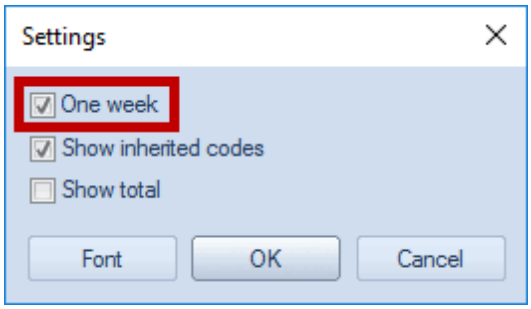
If the 'Count only school days' option is activated, the value in this example will change from 1.395 to 1.200.

The 'Values for count only schooldays' tab in the calendar for the school year explains the changed value.
Deducting the school holidays from the school year leaves 40 weeks. There are 12 weeks available for lesson number 25. These two values are again divided, resulting in a distribution time factor of 12 / 400 = 0.300 If this time factor is now multiplied with the number of weekly periods for lesson 25 the result is 1.200.

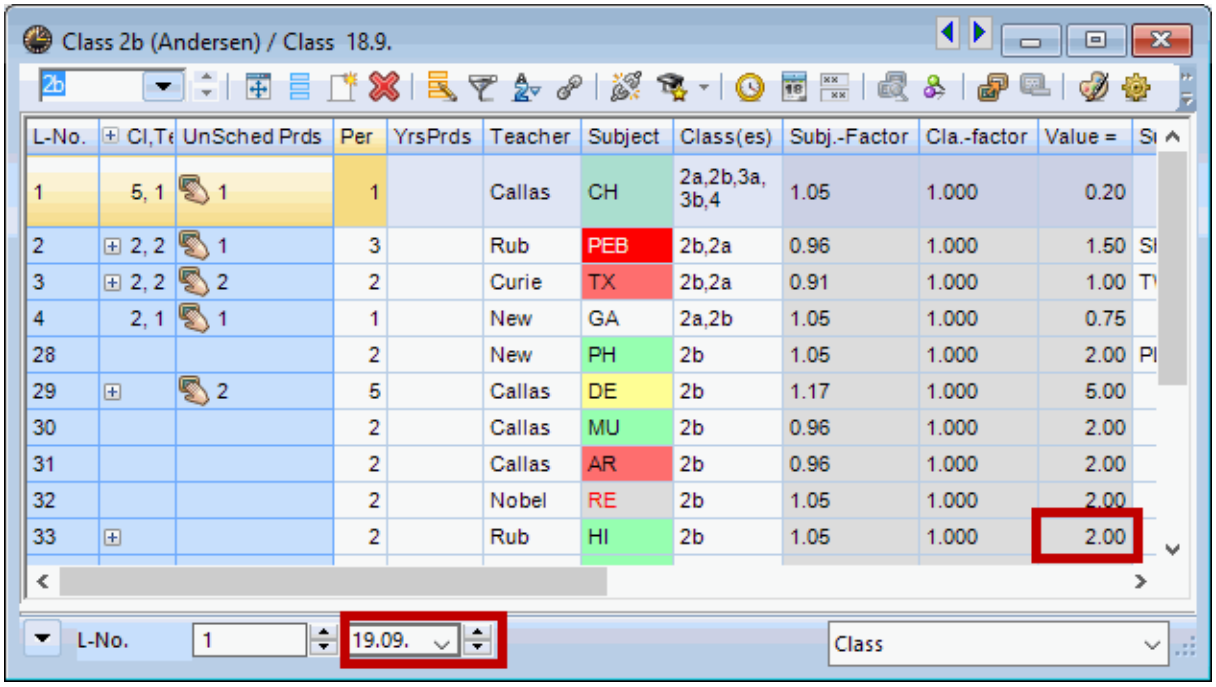


4.3.1.2 The 'One week' option

The lessons windows allow you to display how lessons and subjects are distributed for a certain week. For this, select the <Settings> toolbox icon and then the 'One week' option



Activating this option makes an field available in the centre of the lower section of the lessons view where you can select the week of the lessons to be displayed.



Lesson number 33 is to be held in the period from 5 October - 8 November. The lesson will now only be displayed if a week is specified in which it actually occurs.

The value displayed only relates to the week set, i.e. time limitations are not included in this view.

When using the 'One week' setting it is not important for values referring to the week whether the 'Count only school days' option is activated or not. If the lesson can in principle be held in a certain week (according to the time limitation period or because the week is not in the school holidays) it is included in the value calculation, otherwise it is excluded fully.

Note: Only valid for the current window
The 'One week' setting only applies to the lessons window that is currently active. If, for example, you activate the setting in the teacher' lessons window, it will have no effect on the lessons view of the classes.

4.3.1.3 Fixed values/factors - time limitations

Fixed values and factors also influence date-limited lessons

The section on value calculation in chapter ' Lesson values ' described how you can in general change lesson values. Generally, a time limitation is always included in the calculation, but you can override it by entering a fixed value prefixed using an equals sign('=').

Input value	Meaning	Effect
4.50	fixed value	Overrides teacher, class and subject factors, but not time limitations
=4.50	absolute value	Overrides all factors and time limitations
*4.50	value factor	Does not override other factors or time limitations; additional factor that may e.g. enhance the value of certain lessons.
+4.50	summand	Does not override other factors or time limitations; additional summand that may e.g. enhance the value of certain lessons

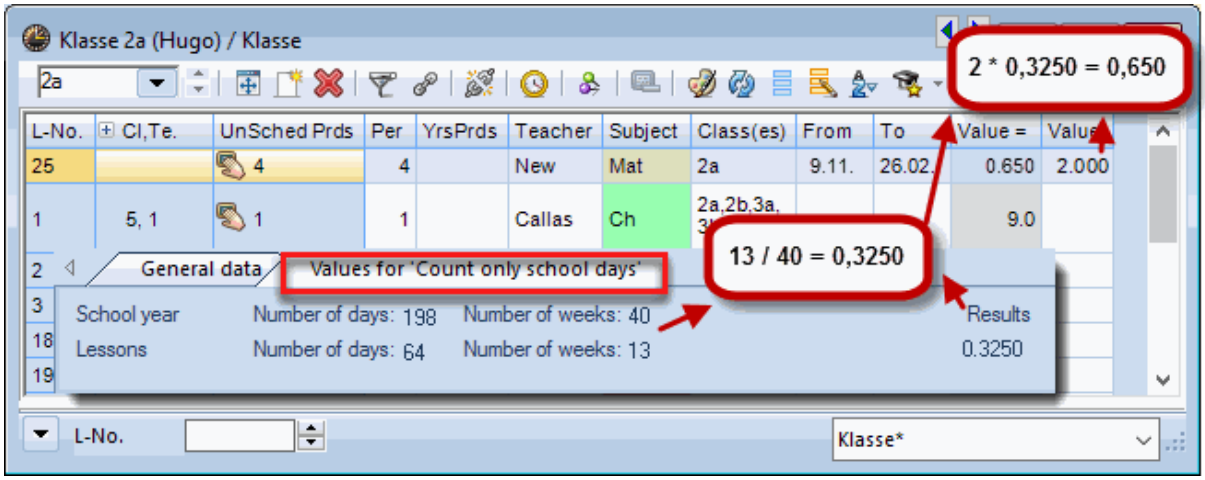
The use of values and factors with time limitations is explained in the examples below:

- Fixed value, time limitation is to count
- Fixed value, time limitation should not count
- Factor or summand

4.3.1.3.1 Fixed value, time limitation counts

We will again be observing lesson number 25 in the Demo2.gpn file. Please set date limits for it for the period from 9 November to 26 February.

Enter the value '2' in the 'Value' column. Entering this number changes the value of lesson number 25 to 0.650.

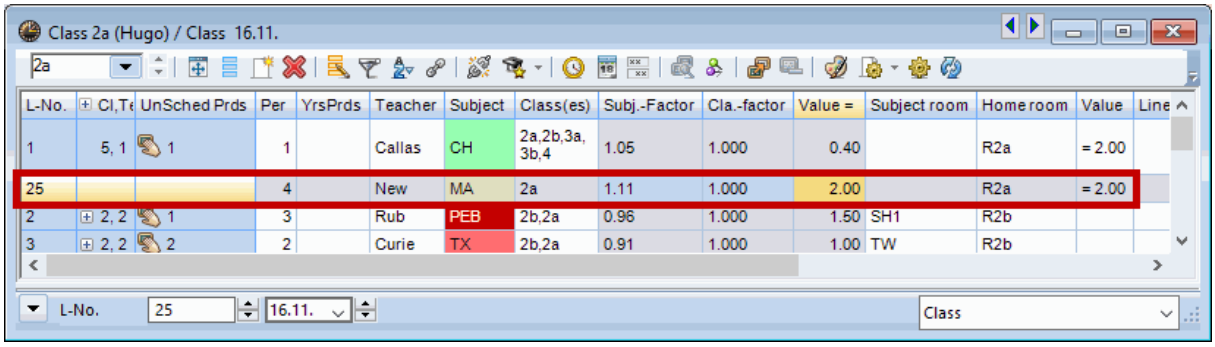


The fixed value, 2 in this example, is multiplied with the time limitation factor 0.3250. You will find the data for value calculation in the yearly school calendar for the lesson.

4.3.1.3.2 Fixed value, time limitation not count

We will again be observing lesson number 25 in the Demo2.gpn file. Please set date limits for it for the period from 9 November to 26 February.

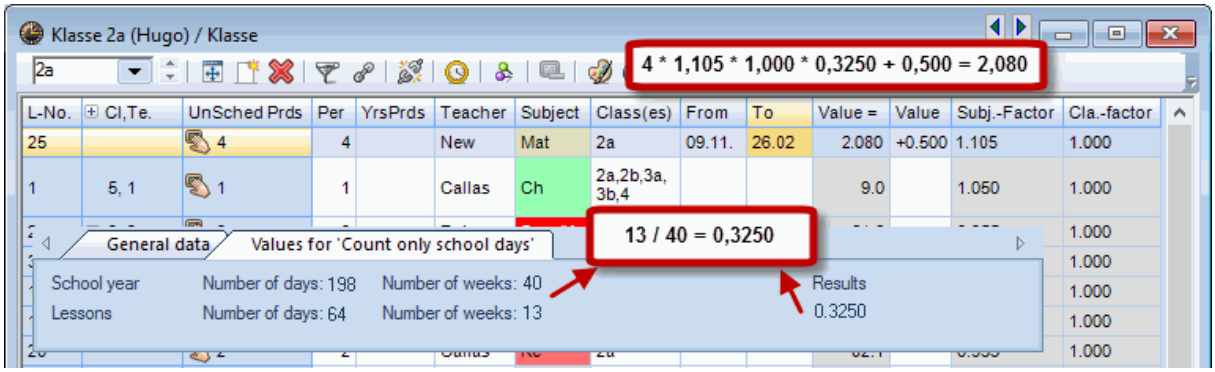
Enter an equals sign followed by 2 in the 'Value' column: '=2'. The time limitation is overridden and the entered value is se



4.3.1.3.3 Factor or summand

We will again be observing lesson number 25 in the Demo2.gpn file. Please set date limits for it for the period from 9 November to 2 February.

By entering a factor or a summand in the 'Value' column, you can upgrade or downgrade the value of the lesson. Teacher, subject and class factors as well as time limitations will be included in the calculation.



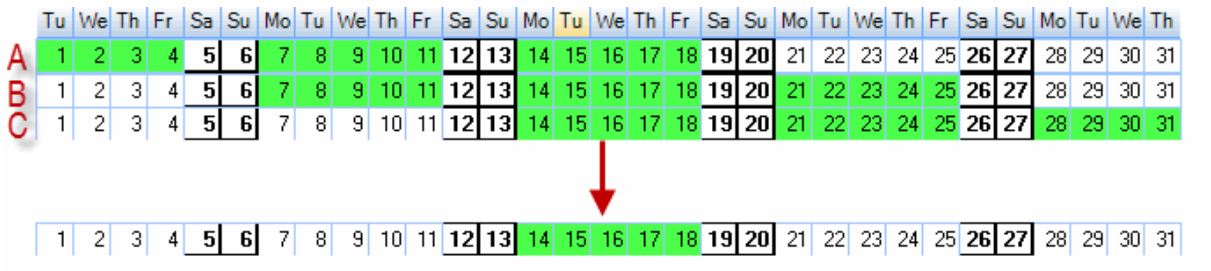
In this example:

(weekly periods) * (subject factor) * (class factor) * (time limitation factor) + (summand) = (value)

4 * 1.105 * 1.000 * 0.5116 + 0.500 = 2.761

4.3.1.4 Several time limitations

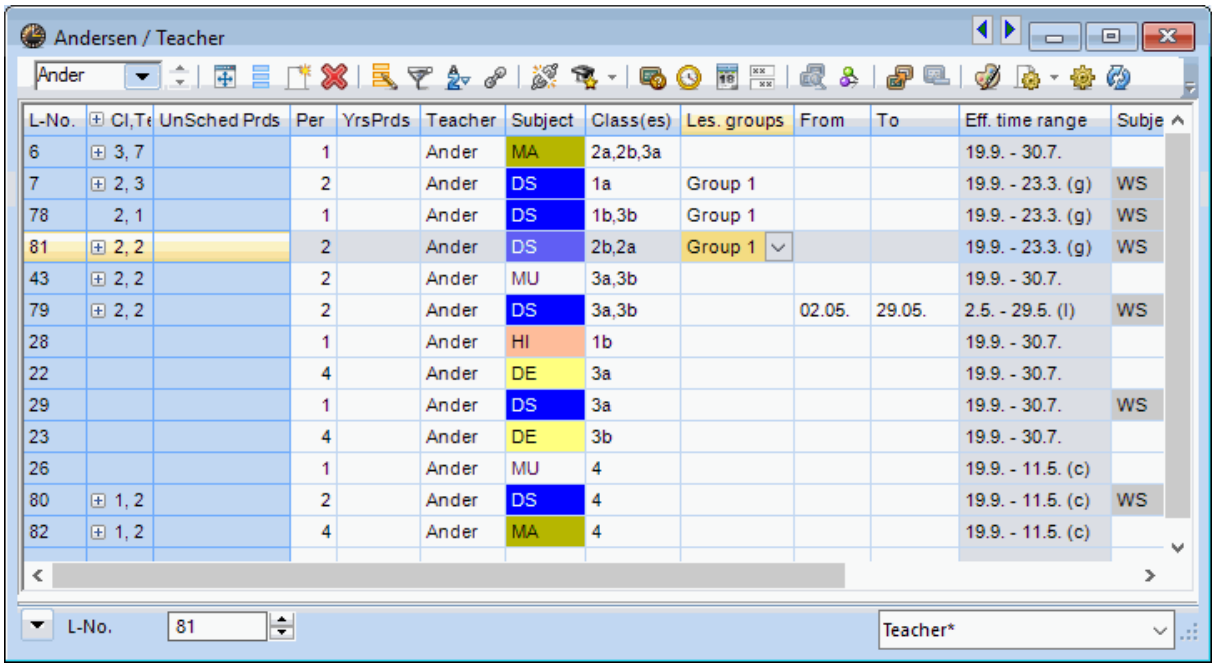
If the individual elements of a coupling are limited to certain dates, the shortest time limitations apply to the whole coupling. This could be a time limitation on an individual element or, if there are overlaps, the average of the overlaps, as shown in the figure.



Tip: Displaying time limitations in lessons
The actual time limitations used for the lesson can be viewed either in the school year calendar or in the grid view of any lessons view via the <Grid adjustment> toolbar icon.

The source of each time limitation is indicated in parentheses:

(l) means a time limitation arising from the lessons,
(c) points to a time limitation due one of the classes and
(g) means that a time limitation is due to a lesson group.



The following table indicates which time limitations Untis can use if you wish to work with more than one time limitation:

C	L	LG	All-important for value calculation
X			**C** ; if several classes are time-limited or if time limitations overlap, the shortest limitation will apply
X	X		**L**

X		**X**	Shortest limitation or period of overlap
	X	**X**	**L**
X	**X**	**X**	**L**

C	Class
L	Lesson
LG	Lesson group

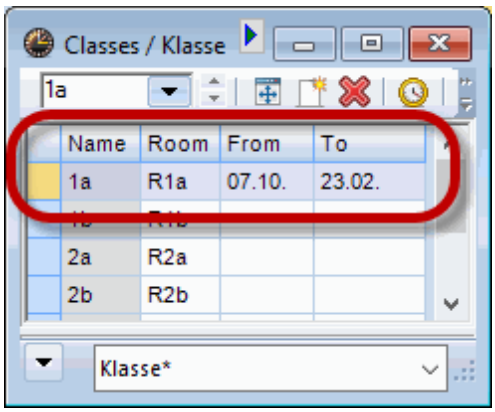
The following example is intended to illustrate how this works.

4.3.1.4.1 Example of several time limitations

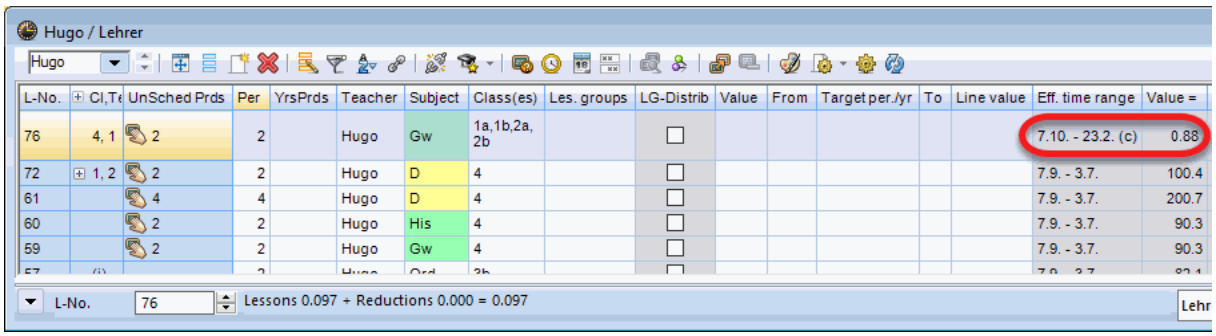
Lesson number 76 in the Demo2.gpn file is used here as an example. This is a coupled lesson with four classes (1a, 1b, 2a and 2b).

For the sake of simplicity teacher, class and subject factors are not considered in this example.

The following date limits are now entered for the classes under 'Classes | Master Data': for class 1a from 7 October to 23 February. This period is used in the calculation of lesson number 76 (limitation factor: 0.4390).



The value for the lesson is the product of weekly periods and time limitation factor: 2 * 0.4390 = 0.88

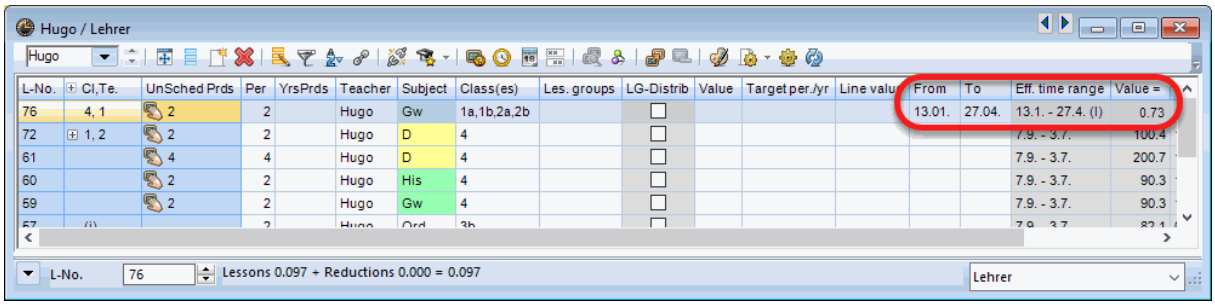


If you now enter a time limitation for the lesson, e.g. 13 January to 27 April (15 weeks), it will apply to the

entire coupling. **All other time limitations will be overridden.**

The limitation factor is now based on the new time limitation: 0.3659.

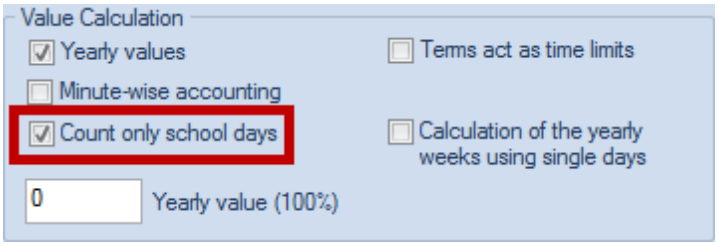
The new value for the lesson is the product of weekly periods and time limitation factor: 2 * 0.3659 = 0.73.



4.3.1.5 Yearly values with time limitations

If lessons are limited to a certain period the calculation of yearly values changes inasmuch as the number of weeks in which they can take place is used instead of the distribution time factor.

The yearly value changes irrespective of whether you have selected the ' Count only school days ' or not on the 'Value calculation' tab under 'Start | Settings | Miscellaneous'. If you do check this option, the weeks containing only holidays will not be counted.



The following exampleshows how this is calculated differently.

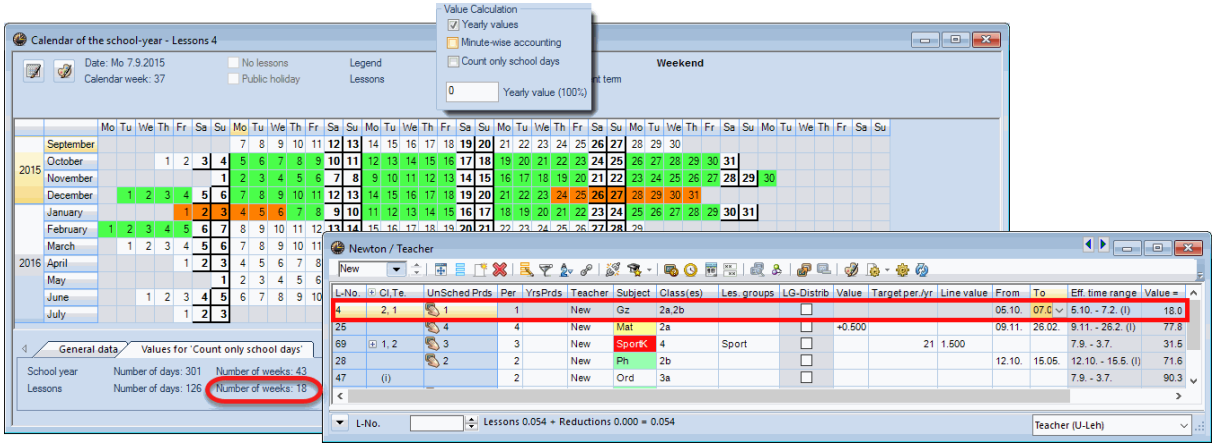
4.3.1.5.1 Examples of yearly values with limits

Lesson number 4 is used here as an example. It should take place between 5 October and 7 Februaryy. Class, teacher and subject factors are not to be included in the calculation.

'Count only school days' not active

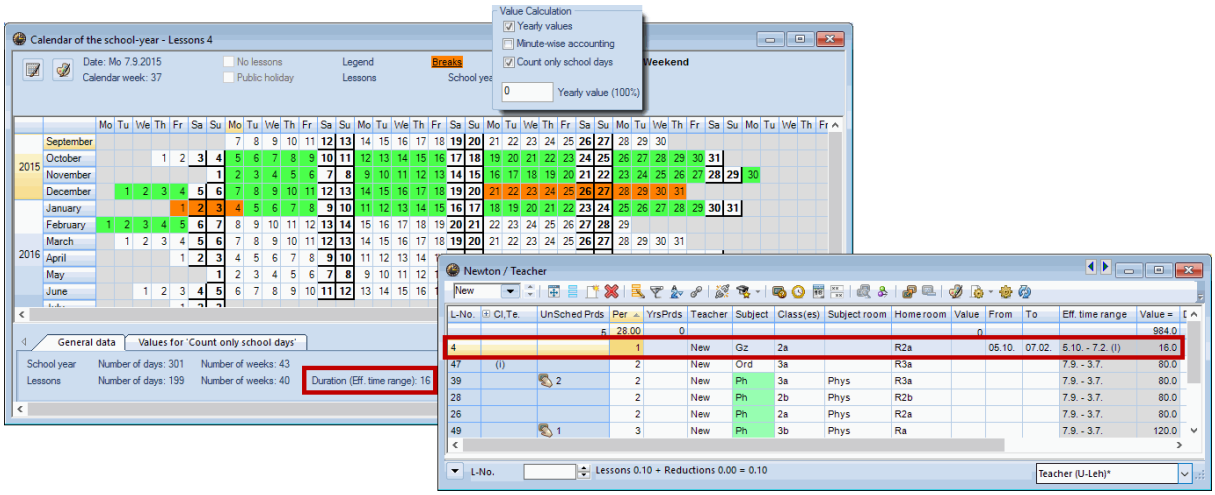
Not activating the 'Count only school days' option means that the calculation is based on 18 weeks. You can see the number of weeks in the school year calendar on the 'Value calculation' tab.

This results in a value of 18.000 for the one-period lesson 4.



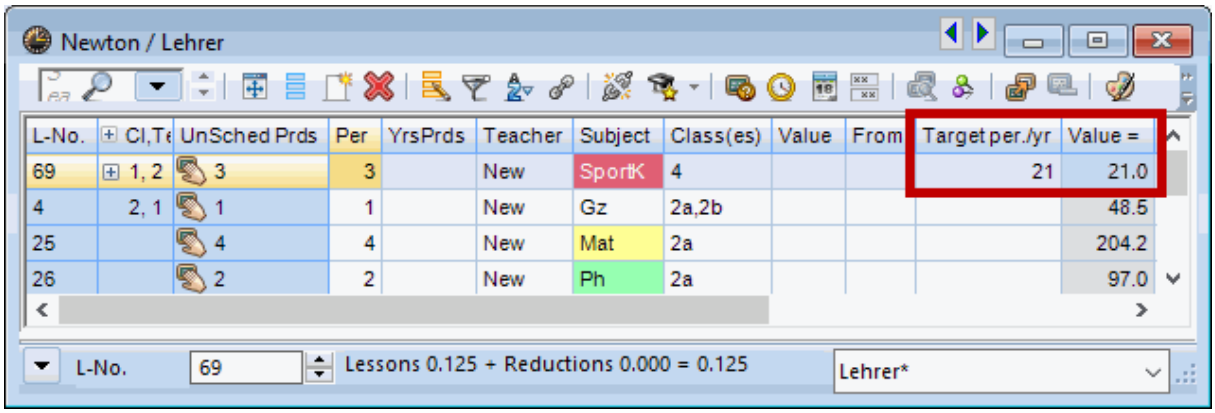
'Count only school days' active

If you activate the 'Count only school days' option, the second week of the Christmas holidays will not be counted. This results in the following value: 1 (weekly period) * 16 (weeks) = 16.000.



Target periods / year

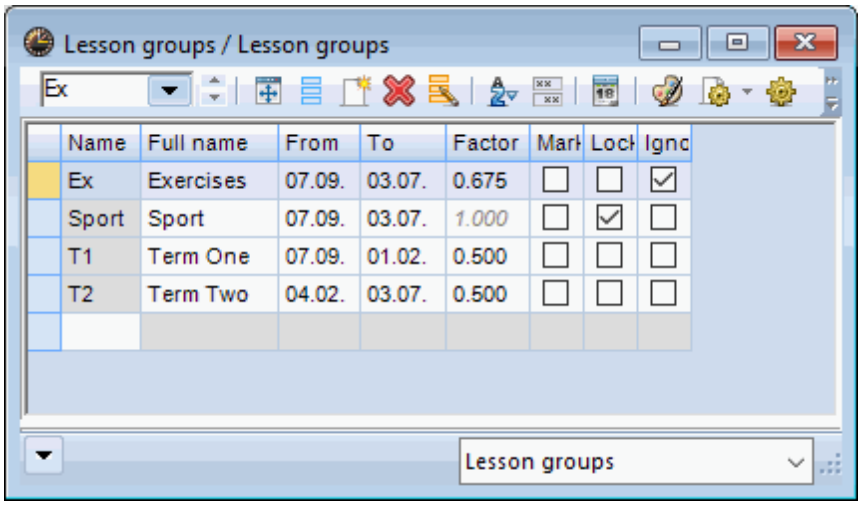
If you enter a value in the 'Target per. / yr.', which you can find in lessons on the 'Values' tab, this hour value will be used for value calculation, and in this case time limitations will no longer be taken into account.



4.3.2 Lesson groups

You can assign lessons to lesson groups which are limited to certain time periods and for which certain factors are valid for value calculation. There can also be interruptions within the time limitation of a group of lessons.

You can find lesson groups on the 'Start' tab very much to the right. For a detailed description please refer to the section 'Multi-week timetable | Lesson groups'.



Note: Modified factor
If the factor has been modified manually it will be in black. If the factor has automatically been calculated by time limitations then it will be grey and in italics.

The following table indicates which time limitations are used for value calculation:

LG	L	C	All-important for value calculation
X		X	Shortest limitation or period of overlap
X	X		Lesson
X	X	X	Lesson

LG Lesson group
L Lesson

C Class

You can find general information on lesson groups in the multi-week timetable manual, chapter ' Lesson group '.

There are several ways to generate values for lesson groups:

- Lesson group without factor
- Lesson group with factor

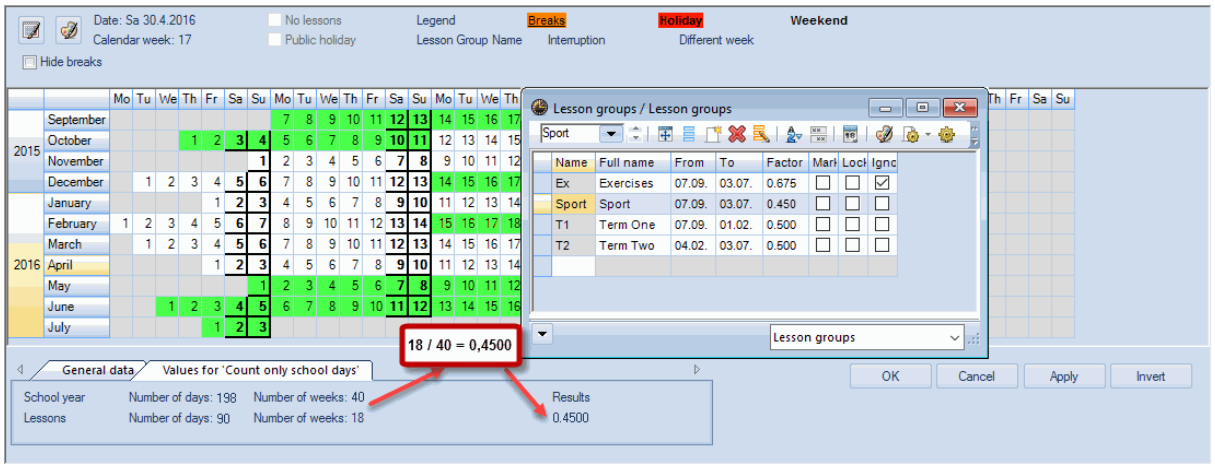
4.3.2.1 Lesson group without factor

If you do not enter any factor for the lesson group, the limitation factor will be calculated from the length of the time limitation and the number of school or teaching weeks in the same way as in chapter ' Value calculation with time limitations '.

Example:

The time pattern below was assigned to lesson group 'Sports'.

The time limitation factor for this lesson group is 18 / 40 = 0.4500.

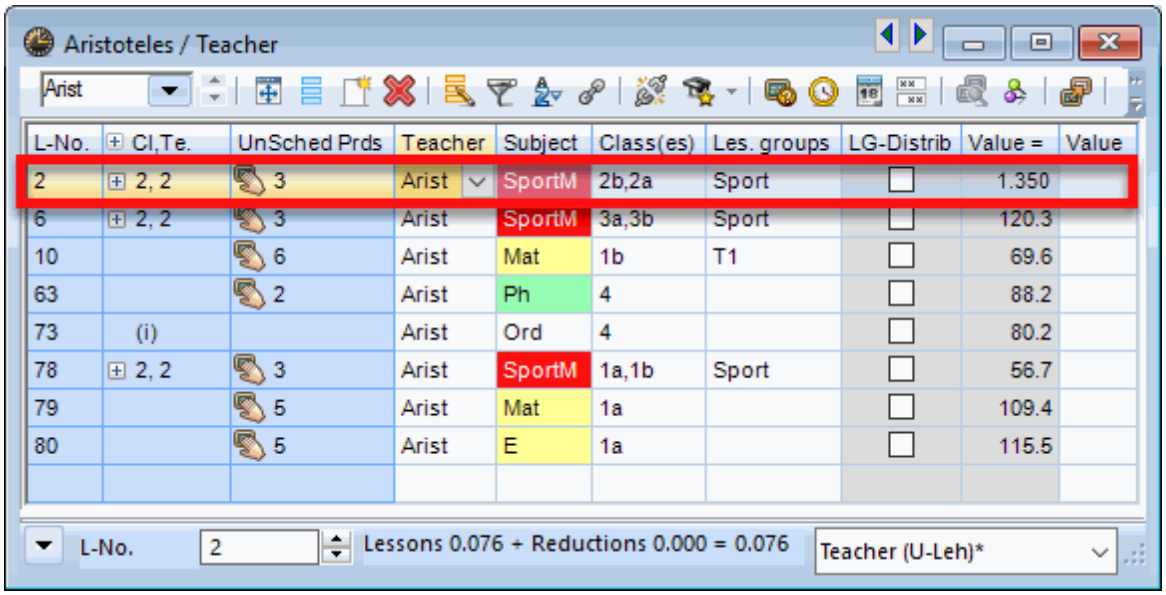


Now open 'Lessons | Teachers' and look at lesson 2 of teacher Aristotle.

The lesson with number 2 of Aristoteles is assigned to the lesson group 'Sports' and the value is the product of weekly periods and time limitation factor for the lesson group:

(weekly periods) * (time limitation factor for the lesson group) = (value)

3 * 0.4500 = 1.350



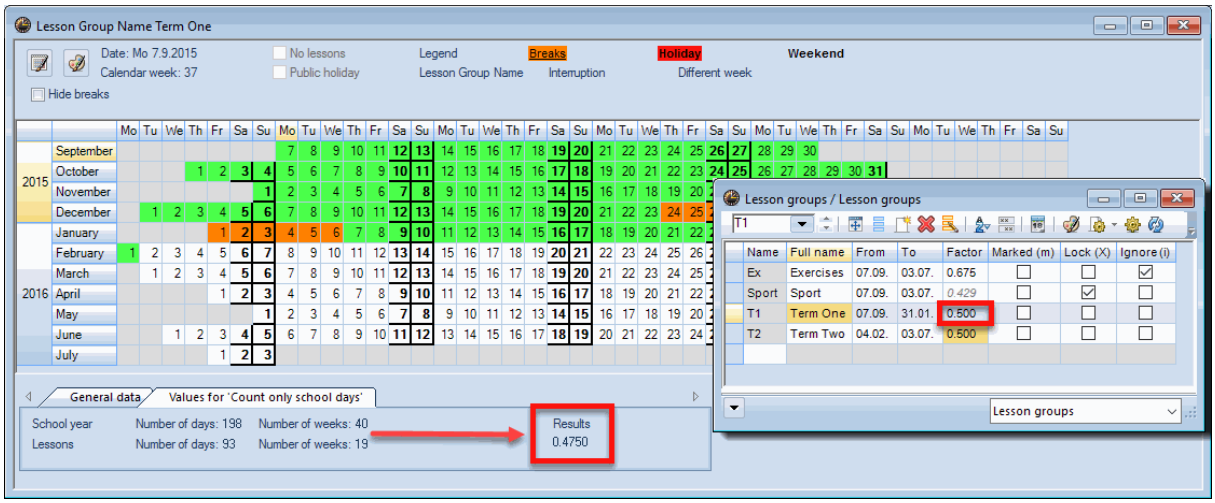
Warning: Time-limited lessons
If a lesson is time-limited and no factor is assigned to the lesson group, only the time limitation of the lesson will be included in the calculation and not the time limitation due to the lesson group.

4.3.2.2 Lesson group with factor

Lesson group with factor You can also define a factor for the lesson group in the 'Factor' column in the lesson group window, for example if each semester is to count the same even if they are not exactly the same length.

Example:

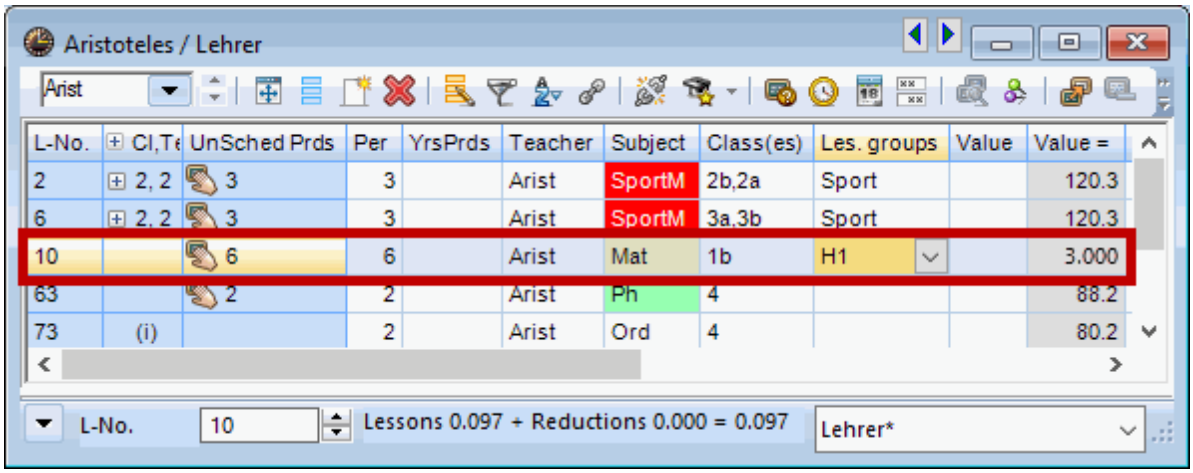
Please open the Demo2.gpn file and deactivate the teacher, class and subject factors. Lesson group H1 is time-limited to the period from 7 September to 31 January. This would in theory result in a factor of 0.475. However, a value of 0.500 has been entered in the 'Factor' column in the lesson group window, and this factor is used for subsequent calculations



If you assign lesson 10 to lesson group H1 the value of the lesson will now be calculated as follows:

(weekly periods) * (time limitation factor for the lesson group) = (value)

6 * 0.5 = 3



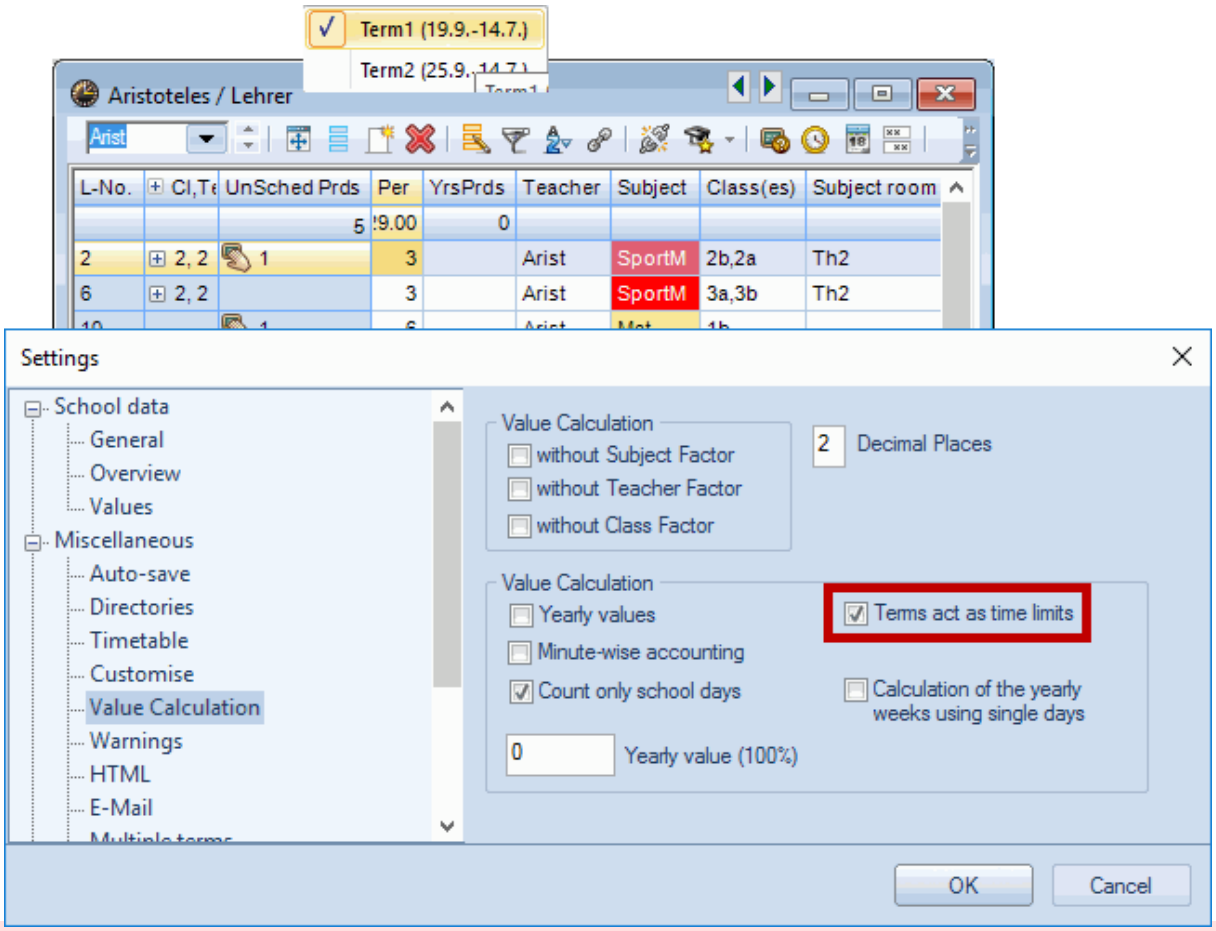
Note: lessons every two weeks
If A and B weeks are not distributed equally over the school year, you can use the proceedings described above also for lessons being held every two weeks.

Warning: Time-limited lessons
If a lesson is time-limited and a factor is assigned to the lesson group, only the factor will be included in the calculation and not the time limitation of the lesson.

4.3.3 Terms

With time limitations the value of a lesson always depends on the length of the term in which it is held.

Warning: Terms
If terms are used, this is no longer the case: A term has the same value as a whole school year as far as value calculation is concerned. This means that a lesson that is held in a term is evaluated as if it were held for the whole school year.
The reason for this is that frequently at the beginning of a school year a short period, e.g. 4 weeks, is planned and its values are then taken as budget values for the remainder of the school year. This prevents for example a one-week ski course during the school year from disrupting the value calculation.
Terms like limitation
If you want to display the value of the lesson which it contributes through the limitation of the term, then go to 'Start | Settings | Miscellaneous' on the 'Value calculation' tab and activate the option 'Terms like limitation'.



The values of Arist's lessons are limited to the time range of this period due to this option and thus significantly lower than weekly periods.

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