

Class Maker

User Guide

(Updated 11 February 2018)



CLASSMAKER
AA EDUCATIONAL SOFTWARE

Class Maker 2018

Program Description

Creating classes for the new school year is a time consuming task that teachers are asked to complete each year. Many schools offer their students the opportunity to request friends to accompany them into the new year. The task of trying to balance class size with student academic ability, behaviour, classroom participation and gender while ensuring that everyone has a friend is considerable.

Class Maker is an innovative software solution, developed to streamline this process and provide a number of balanced grade alternatives for teachers to choose from. Class groups can be sorted according to the following criteria.

- **Friend Requests**

Students have the opportunity to nominate up to 5 friends who they would like to be with the following year. Class Maker uses advanced matching algorithms to satisfy these requests. The program also offers the option to relax these requirements by allowing some friend requests to remain unfulfilled.

- **Student Separation**

Class Maker provides teachers the ability to separate students, even if the student has requested a particular friend. The teacher's condition overrides the student's request.

- **Essential Student Grouping**

There are times when students need to be kept together. Class Maker allows teachers to fix any number of student pairs or multiple groups of students into the same class.

- **Multi-age (composite) classes**

Class Maker provides the teacher the ability to create multi-age classes with 2 or 3 different year levels, and to control the ratio of each year level in the created classes.

- **Manual Class Size**

By default, Class Maker creates grades of equal or near-equal size. However, it also offers the ability to create classes of any size to suit the requirements of the school.

- **Gender Ratio**

It can be important to maintain a mix of male and female students in a particular grade. Class Maker provides the teacher the ability to produce class sets with any gender ratio required.

- **Teacher choice**

A student may need to be placed in a particular teacher's class, or alternatively there may be a request to not be placed with that teacher. Class Maker offers this choice as an option.

- **File Compatibility**

Class Maker provides an easy to use Microsoft Excel template for student data input, which includes internal checking to ensure correct spelling of students' names. Class Maker outputs the sorted class data in Excel compatible format for easy viewing, manipulation and printing.

Quick Start Guide

Class Maker is designed to sort students into classes using student friend requests and teacher requirements to produce class sets with an even gender balance, student academic ability and social skills, while ensuring that every student has at least one friend in their new class. The basic steps required to use Class Maker are:

1. Use Microsoft Excel to create the Student Database File for a single year level (or composite) containing the student friend requests, ability levels, and any teacher requirements such as essential groupings or student separation. A template comes in the Class Maker zip file.
2. Load your Student Data File into Class Maker and run the program, setting the number of classes required, maximum gender ratio for each class, or any special requirements.
3. Tweak the automatically created Class Sets (if necessary) to fine tune the results.
4. Save the generated Class Sets into an Excel compatible format for later use.

Details on how to create the Student Data File are on page 4. This is the most important part of the process, for without good data files, the process will be hampered from the outset. Some points to remember when creating your Student Database File are:

- Use Essential Friend and Incompatible student pairings only when necessary. Class Maker will prioritise these requirements over the students' friend requests, and overuse may cause Class Maker to be unable to find any solution
- Make sure you spell the students names correctly – entering misspelled names makes it impossible for Class Maker to match the names in the file
- The more friend requests each student has, the easier it is to find a solution where every student has at least one friend in their new class. It is often the case that when Class Maker takes a long time to find any solution, there are a number of students with only 1 or 2 friend requests, and with all the other requirements placed on the class sets there is simply no solution where each child has at least one friend. More is more!
- When adding teachers to the Student Database File, please make sure you enter the letter "T" in the third column, otherwise Class Maker will treat them just like any other student!
- You can save the class sets generated by Class Maker in 2 formats:
 - "Summary" Data format, containing just the student names in the sorted class lists. This format is most useful for the final Class Set.
 - "Full" Data format, containing all the student data in the sorted class lists. This format is most useful for sharing amongst other school staff for later editing or fine tuning prior to final approval.

Both file formats can be imported back into Class Maker for further fine tuning, however data saved in "Full" Data format is easier to import later.

- Sometimes it may be necessary to allow some "Friendless" students or "Incompatible" pairs to be present when making the Class Sets. If you have too many "Essential" friends or "Incompatible" pairs specified and Class Maker hasn't found any solutions, try increasing the number of friendless or incompatible students and try tweaking the resulting classes.

Student Information File Input

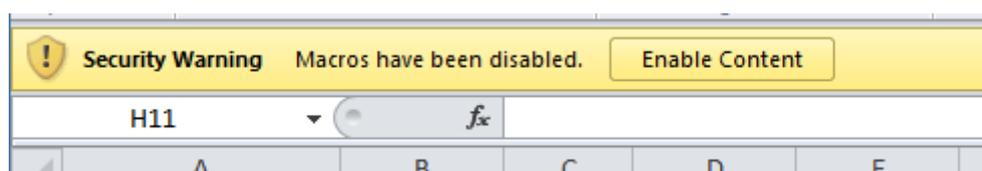
The Excel student template file

Class Maker uses a familiar Excel file format for entering student information. A template is included with the software to help you create your own class sets. It is **highly recommended** that you use this template for your own class lists, as it contains macros and internal checks to ensure the students' names are spelled correctly and in the correct format. The image below shows an example Excel student template data file which can be used for demonstration of the software. **To enter your own school's student information, please use Excel to open the template file ("Class list 2018 template empty.xls"), which you can find in the "C:\Class Maker\Data Files" folder.** There are also some example student template files included with the Class Maker zip file which you can use as a guide (for instance the file named "Class list 2018 template demo.xls"). An extract of this file is shown below to describe the features of the template files.

1	names!	Gender	Year Level	Numeracy	Literacy	Behaviour	Participation	Accelerated	ESL	Essential Friend	Friend 1	Friend 2	Friend 3	Friend 4
3	Betty Butterfly	F	2	3	4	1	3			Yes	Nancy Numbat	Lisa Lemur	Queen Quokka	Darren Dog
4	Charlie Camel	M	2	1	3	5	1				Darren Dog	Nancy Numbat	Peter Pig	Betty Butterfly
5	Darren Dog	M	2	3	5	1	5				Hermione Horse	Tabitha Tortoise	Francine Frog	Jessica Jaguar
6	Edward Emu	M	2	5	3	3	3	Yes			Nancy Numbat	Ivan Iguana	Rebecca Rabbit	Queen Quokka
7	Francine Frog	F	2	5	3	3	1		Yes		Max Monkey	Lisa Lemur	Peter Pig	Samantha Snake
8	Gerald Giraffe	M	2	5	5	1	3				Nancy Numbat	Betty Butterfly	Ivan Iguana	Darren Dog
9	Hermione Horse	F	2	2	3	3	3			Samantha Snake	Betty Butterfly	Andrew Aardvark	Darren Dog	Charlie Camel
10	Ivan Iguana	M	2	3	5	1	5				Edward Emu	Lisa Lemur	Charlie Camel	Andrew Aardvark
11	Jessica Jaguar	F	2	1	3	3	3			Olive Ostrich	Nancy Numbat	Francine Frog	Olive Ostrich	Darren Dog
12	Kris Kangaroo	M	2	4	1	5	3				Peter Pig	Betty Butterfly	Darren Dog	Ivan Iguana
13	Lisa Lemur	F	2	5	3	5	1	Yes			Nancy Numbat	Jessica Jaguar	Edward Emu	Rebecca Rabbit
14	Max Monkey	M	2	5	4	3	3				Nancy Numbat	Lisa Lemur	Francine Frog	Peter Pig
15	Nancy Numbat	F	2	3	1	5	3				Charlie Camel	Andrew Aardvark	Francine Frog	Gerald Giraffe
16	Olive Ostrich	F	2	5	3	3	4			Darren Dog	Peter Pig	Francine Frog	Samantha Snake	Samantha Snake
17	Peter Pig	M	2	1	2	3	5		Yes		Ivan Iguana	Francine Frog	Rebecca Rabbit	Gerald Giraffe
18	Queen Quokka	F	2	3	5	1	2				Charlie Camel	Andrew Aardvark	Edward Emu	Ivan Iguana
19	Rebecca Rabbit	F	2	1	3	2	3				Lisa Lemur	Olive Ostrich	Francine Frog	Max Monkey
20	Samantha Snake	F	2	1	3	3	3				Wrong Spelling	Kris Kangaroo	Nancy Numbat	Darren Dog
21	Tabitha Tortoise	F	2	4	1	2	3	Yes			Kris Kangaroo	Betty Butterfly	Lisa Lemur	Edward Emu
22	Mr. T	T									Andrew Aardvark			
23	Ms. A	T									Jessica Jaguar			
24	Miss B	T									Essential Friend			

The Excel student template file which comes with Class Maker 2018 will check for incorrect spelling of the students' names using the "Conditional Formatting" option in Excel. Note the name in Samantha Snake's row (cell K20), where the name "Wrong Spelling" has been entered (see example spreadsheet above). This background colour of this cell is not coloured green, as the Excel file has been set up to cross-check all the cells containing student names against the names entered in Column A – if an *exact* match is found, the cell will turn green.

Copying names from one cell to another can break this conditional formatting, but it can be restored using a Macro included with the file. Make sure that "Macros" are enabled when opening the file, and hit "Ctrl q" to restore the conditional formatting. ("Ctrl q" means hold the "Ctrl" button down, then hit the "q" key). When you open the template file you may see the warning message in yellow at the top of the spreadsheet which looks something like this.



You **must** click on the “Enable Content” button to enable the macro. The macro will also remove any additional spaces in the student names, whether in front of the first name, behind the second name, or even double spaces in between the names. It is good practice to use the macro to check your student data file before trying to run Class Maker.

Once you have updated the file and you are happy with all the spelling, save the file in Excel format using your own file name (eg. Grade 2 list 2018.xls). This file will be used to generate your new class data.

In Class Maker 2018 and users of Office 2010 or later is the ability to select the student names in Excel from a drop down list. It is not essential to enter the data this way, as you can still type in the names manually, however some people prefer the drop-down method. It ensures that the spelling of the student names is correct, as the only available data is the list of names in column A. Therefore it is necessary that the full list of student (and staff if desired) names are available in Column A, and that there are **no empty rows** in the Student Name column (Column A) since an empty row will cause the drop-down menu to fail to include all the students’ names.

In the example shown below, the “down arrow” symbol has been selected in cell J14, which shows the list of available names from column A. Note that the name “Wrong Spelling” has been entered into cell J11, which shows it is still possible to manually enter data not present in the list. Using the macro “**Ctrl q**” will now also circle this cell to show you that the spelling is incorrect. Once corrected, pressing “**Ctrl q**” again will clear this circle.

6	Lawrence Emu	M	2	5	3	3	1	Yes	Nancy Numbat
7	Francine Frog	F	2	5	3	3	1	Yes	Max Monkey
8	Gerald Giraffe	M	2	5	5	1	3		Nancy Numbat
9	Hermione Horse	F	2	2	3	3	3		Betty Butterfly
10	Ivan Iguana	M	2	3	5	1	5		Edward Emu
11	Jessica Jaguar	F	2	1	3	3	3		Nancy Numbat
12	Kris Kangaroo	M	2	4	1	5	3		Peter Pig
13	Lisa Lemur	F	2	5	3	5	1	Yes	Nancy Numbat
14	Max Monkey	M	2	5	4	3	3		Nancy Numbat
15	Nancy Numbat	F	2	3	1	5	3		Charlie Camel
16	Olive Ostrich	F	2	5	3	3	4		Peter Pig
17	Peter Pig	M	2	1	2	3	5	Yes	Ivan Iguana
18	Queen Quokka	F	2	3	5	1	2		Charlie Camel
19	Rebecca Rabbit	F	2	1	3	2	3		Lisa Lemur
20	Samantha Snake	F	2	1	3	3	3		Jessica Jaguar

Wrong Spelling
Andrew Aardvark
Betty Butterfly
Charlie Camel
Darren Dog
Edward Emu
Francine Frog
Gerald Giraffe
Hermione Horse

Student template column descriptions

Column A – Student ID

Column A is where the students' names are placed. In Class Maker 2018 names can be in either "Firstname Lastname" format, or "Lastname, Firstname" format. Previous versions of Class Maker required the names in "Firstname Lastname" format only. It is important to remember to keep the formatting consistent for all the names (including teachers' names), otherwise Class Maker may generate errors or give unpredictable results.

Some education departments issue student names in "Lastname, Firstname" format. If you have your student data in this format and you would like to use "Firstname Lastname" format, another Excel file which is included in the Class Maker 2018 package will reformat the student names for you. This file is called "Firstname Lastname swap with commas updated.xlsx".

Columns B to C – Student information

Column B contains the gender of the student, which must be either "M" or "F" (without the "quotes"). Column C contains the student's current year level. For kinder/prep/foundation students you can enter the number zero ("0"). This column is used for multi-aged (composite) class creation.

This is also the column where you can identify a teacher by entering the letter "T". If you want to link students with particular teachers to make your classes, you must include the same number of teachers in your data file as you have classes (ie 4 teachers for 4 classes). Teachers only need a name (eg "Mr. A" or "A, Mr.") and the letter "T" placed in column C.

Columns D to I – Student ability and personality levels

These optional columns provide additional information about the classes the program makes. When Class Maker finds a class set where all the students have friends, it then uses the data in these columns to calculate averages for each class. This will help avoid the situation where one class has all the high achievers while another is relatively low. It can also avoid having all of the quieter students in one class while filling another with students who have poor behaviour.

Class Maker 2018 allows you to customise columns D to I to suit your own school requirements. By changing the text in the appropriate column in row 1 of the spreadsheet, you can specify your own identifier. For instance, you may not need the "Participation" column, but may instead wish to identify ESL ability levels, or musical ability etc. By changing the text in the column header, Class Maker 2018 will use this identifier in its class averages.

Class Maker 2018 allows you to enter either five levels of performance or three. You can enter the ability score as a number from 1 to 5, and Class Maker 2018 will calculate an average for the entire class based on these scores, centred about 3. For backwards compatibility with previous versions of Class Maker, you can also enter "L", "M" or "H" in these columns. These will be given scores of 1, 3 and 5 respectively. If you do not enter a score in any particular cell, Class Maker 2018 will assign a value of 3 to that cell.

Class Maker 2018 allows teachers to identify students who may be a member of a group who may need to be treated differently to the rest of the students. For instance, they may be on an accelerated program, or may require additional assistance (for example ESL/EAL). Class Maker 2018

allows teachers to easily identify in which classes these students were placed. The default descriptors are “Accelerated” and “ESL”, but these are easily changed in the Excel template by modifying cells **H1** and **I1**. To mark a student as belonging to either group, simply type “Yes” or “Y” in the student’s row Class Maker will note that accordingly. The demo file which comes with Class Maker 2018 shows an example of the correct format to use. If a student is not a member of either group, or you do not wish to use this feature, just leave the cell blank.

Column J – Essential friend

This column is used to force students together into a particular class. Enter the student’s name in column J to keep the students together, or leave blank. When the program runs, it will only produce solutions where these two students are together.

In the example above, “Samantha Snake” must be in the same class as “Hermione Horse”. Note that you do not put Hermione into Samantha’s Essential friend cell. If you need more than two friends together, you can “daisy chain” the friends. For instance, if you put, say, Lisa Lemur into Samantha Snake’s “Essential Friends” column, the program will only output solutions where all 3 students are in the same class.

To place students with teachers, please follow these steps:

- Enter the student’s name (eg Andrew Aardvark) in the teacher’s “Essential” cell
- If you have another student who needs to be placed with the same teacher, enter their name into Andrew Aardvark’s “Essential” cell
- Continue to “daisy chain” the students together in this way until you have finished with all the students in Mr. A’s class
- If you have students who need to go in another teacher’s class (Mrs. B), continue with the same pattern.

It is important you follow this pattern, as this will allow Class Maker to assign students correctly.

This feature should only be used for those situations where it is absolutely essential, as forcing too many students together can significantly reduce the number of solutions available for Class Maker to find! It will also significantly increase the time Class Maker will take to find a solution. Best practice is to have no more than about 10% of students with an Essential friend specified.

Columns K to O – Friend requests

This is where the student friend requests are placed. Up to **5** friends per student can be specified, but having less than 4 makes finding a solution far more difficult, especially if there are a lot of students in your class list. It will also increase the time taken to find a solution, and in extreme cases it may be impossible! If less than 5 friends are requested, please leave the other cells blank or fill with “0” (zero).

For new students, you can leave columns K to O blank. Class Maker will assign their own name into Column K, meaning that wherever they are placed they will have a friend (themselves).

Columns P to Q – Incompatible student pairs

This is where you can force students to be separated from each other in the classes. Names in these columns override any of the student’s friend requests, and only needs to be in one of the

incompatible students' area, not both. Use this option carefully, as forcing too many students apart from each other can lead to no solution being able to be found!

Like specifying Essential friends, this feature should only be used for those situations where it is absolutely essential, as forcing too many students apart can significantly reduce the number of solutions! It will also significantly increase the time Class Maker will take to find a solution. You should have no more than about 20% of students with Incompatible students specified. If you accidentally place a student in both the Essential column and the Incompatible column, Class Maker will alert you to this fact, otherwise the program will run forever and never come up with a solution!

Working with teachers in Class Maker

Teachers are treated slightly differently to students in Class Maker.

In Column A, you must enter the teachers' names in the same format as the students. If the students' names are in "Firstname Lastname" format, then the teachers' names must be entered as "Mr. A", "Ms B" etc. (without the "quotes"). If the students names are in "Lastname, Firstname" format, then the teachers' names are entered as "C, Miss" or "D, Mrs".

In Column C, enter the letter "T". You do not need to enter any other information about the teacher in columns B, or D to I.

To place students with teachers, please follow these steps:

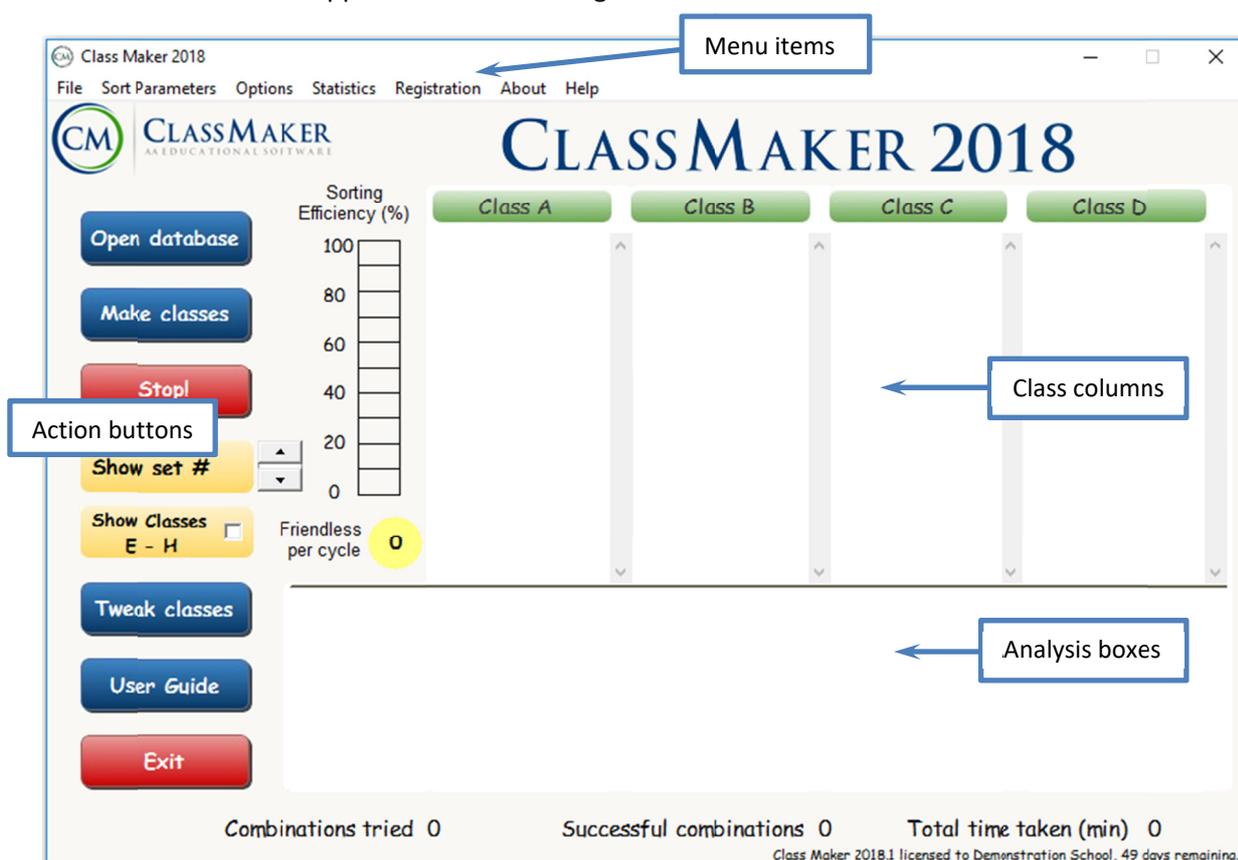
- Enter the student's name (eg Andrew Aardvark) in the teacher's "Essential" cell (Column J)
- If you have another student who needs to be placed with the same teacher, enter their name into Andrew Aardvark's "Essential" cell
- Continue to "daisy chain" the students together in this way until you have finished with all the students in Mr. A's class
- If you have students who need to go in another teacher's class (eg. Mrs. B), continue with the same pattern as above.

It is important you follow this pattern, as this will allow Class Maker to assign students correctly.

To separate students from teachers, simply place the teacher's name in either of the particular student's "Incompatible" columns (Column "P" or "Q").

Running Class Maker 2018

Once you have created your class database file, start the program. The first time you start the program you may need to run in Administrator mode. Right click the program and select “Run as Administrator”. The program will check for a valid licence file (ClassMaker-Licence.lic) which needs to be in the same folder as the program. If there is a problem with the licence, an error message will appear and the program will default to the “demo” version. Contact the developers if you believe you have a valid licence file and the program is not recognising it properly. If a valid licence is found, the licence holder will appear in the bottom right corner of the main window.



Registration

The only way to register your copy of Class Maker is to save the licence file which has been sent to you by email onto your computer. The licence file is named “ClassMaker-Licence.lic”, and all you need to do is save this file to the “C:\Class Maker” directory (or the directory in which you installed Class Maker).

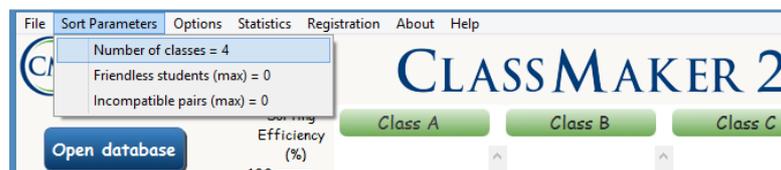
Open database file

To open your class database, click on the “Open database” button. A dialog box will open, showing valid Excel database files. Navigate to the directory containing your database file and either double click the file, or single click on the file and press “Open”. The program will then check the database file for errors. If a student name is misspelt or not present, a dialog box will appear providing information as to which student has errors in the Excel database file. You will then need to edit the database file to make sure the spelling in the file is correct.

If the Excel database is correctly formatted, the program will perform a quick analysis of the data, giving the number of students read and the average gender balance of the group. This will help you ensure the database is complete and set limits for the gender balance of the final class sets.

Sort Parameters menu

Clicking on the “Sort Parameters” menu item brings up the box shown below.

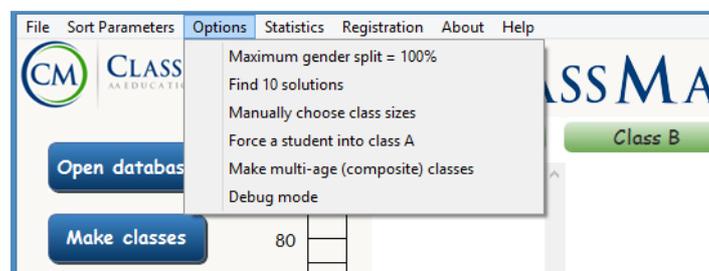


This area lets you choose the number of classes you want to place the students into. The “Standard” version of the program allows up to four classes, the “Extended” version allows up to nine. Click on the “Number of classes” area and a dialog box will appear, asking you to enter a number. The value you enter will now appear in the menu item, and the number of Class columns will change.

It is also possible to allow the program to produce class sets with students which do not have a friend (Friendless students) or allow incompatible student pairings (Incompatible pairs). Entering a number other than zero into these fields will produce these solutions. For particularly difficult class groups this option may be helpful to narrow down the options from which you can choose from for the final class sets. It’s also useful to increase these numbers to ensure the program is working correctly the first time. Once you are happy the program is working, you can reduce these back to zero.

Options menu

Clicking on the “Options” menu button brings up the box shown below.



Here you can set the class gender ratio, change the number of solutions the program finds, manually choose the class size, force a particular student into Class A or make multi-age (composite) classes.

Set gender ratio limits

By default, the program will sort students into friendship groups, regardless of gender. This may lead to classes containing all boys or girls (ie 100% gender split). By clicking on the option button, it is possible to force the program to only accept a maximum gender split (say 75% of any one gender) in every class. However, setting a value too low may mean it is impossible to find a solution (for instance, if the gender ratio of the entire group is 75% girls, setting a value less than this would make it impossible to find a solution). If you have forgotten the gender ratio of the entire group, pressing the “Statistics” menu button will show you.

Number of solutions required

The program will continue searching for solutions until it reaches the value shown in the “Find XX solutions” area. You can choose a value from 1 to 30 solutions until the program stops, by clicking on this menu item button.

Manually choose class sizes

The “Manually Choose Class Sizes” option allows you to, well, manually choose the class size. First tell the program how many classes you require using the “Sort parameters” menu item. Next, press the “Manually Choose Class Sizes” button to bring up a series of input boxes into which you enter the class sizes. The class size numbers will then appear in the Class column headings.

Force student into Class “A”

If a particular student (or group of students) needs to be placed in a particular class, then use “Force student into Class A” option. This may be used if a particular student needs to be placed in a small class size for instance. This option will significantly increase the time taken to find a solution.

Multi-age (Composite) class creation

If you need to make multi-age (composite) classes, the program will use the values in column C of the student information file spreadsheet. You can make classes with 2 or 3 different year levels using Class Maker. After you press the “Make Composite classes” button, follow the prompts to set up your classes. If you are making classes with two age levels, Class Maker will ask you to set the maximum age ratio in each class. In other words, you can set a value of (say) no more than 70% of a particular year level in each class.

For composites containing three age levels, you need to set the age split manually for each class. For example, let’s say class A contains 10 year 3’s and 6 year 4’s, while class B contains 6 year 3’s, 6 year 4’s and 6 year 5’s, and so on. If you make a mistake entering the class numbers (for multi-age composites containing three year levels) or the year level ratio (for multi-age classes containing two year levels), just hit the “Cancel” button and start again. If you want to try a different class ratio or number, simply click on the “Composites” button (which turns the option off), then click on it again to restart the process.

If instead you would like to make (say) three 3 straight Year 3 classes, three straight Year 4 classes and a single 3/4 composite, it will be far quicker to make these classes in two separate sorts using the “Manually Choose Class Size” option. Set Class A in each year level to have (say) 10 students, and Classes B to D to contain 20 students each. You can then manually combine both Class A sets to give you the multi-age composite you require.

Debug mode

The Debug mode shows some more information if Class Maker 2018 is finding it hard to find a solution. You shouldn't need to use this feature unless requested by the developers.

Make your classes

Once you are happy with the database and all the options, press the "Make Classes" button. The program will start rearranging the student list and place the students into classes. After each combination is created, the "Combinations tried" value will increase, each successful combination will increase the number next to the "Successful combinations" box. After each successful combination, the student lists will appear in the Class columns.

If you believe you have enough combinations, or you don't believe the program is working properly, pressing the "Stop" button will stop the program searching. You can then change some of the parameters and start again, or view the solutions the program has found. If you have specified a number of restrictions, the program could take some time to come up with a solution. Particularly difficult class sets with a number of essential groups, student placements and incompatible students can take a long time to find a single solution. (Of course, you can do something else while the program runs in the background). If it still can't find a solution, re-check your student database file to make sure you haven't got a student which you are forcing to both be with and without another student. Relaxing the "Number of friendless students" or "Incompatible students" can help here.

Once the program has found the required number of solutions, the screen will look something like the figure below. This example used the sample Excel file above (after changing the name "Wrong Spelling" to something more appropriate).

Class Maker 2018 - Class list template 2018 demo

File Sort Parameters Options Statistics Registration About Help

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CLASSMAKER 2018

Sorting Efficiency 99%

Class A (7) Class B (7) Class C (6)

Mr. T
Andrew Aardvark
Edward Emu
Gerald Giraffe
Hermione Horse
Nancy Numbat
Samantha Snake
Tabitha Tortoise

Ms. A
Darren Dog
Ivan Iguana
Jessica Jaguar
Lisa Lemur
Olive Ostrich
Peter Pig
Rebecca Rabbit

Miss. B
Betty Butterfly
Charlie Camel
Francine Frog
Kris Kangaroo
Max Monkey
Queen Quokka

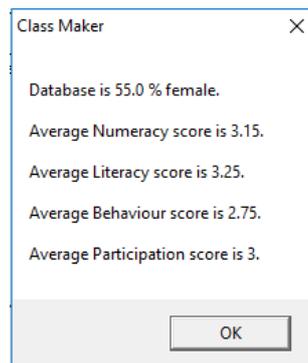
Friendless per cycle 0

Female %	57.1 %	57.1 %	50.0 %
Numeracy	3.28	2.71	3.5
Literacy	3	3.42	3.33
Behaviour	2.71	2.57	3
Participation	3	3.71	2.16
# friendless	0	0	0
# incompatible	0	0	0
Multi-age split	Not Applicable	Not Applicable	Not Applicable

Combinations tried 8123 Successful combinations 10 Total time taken (sec) 0.87

Class Maker 2017.1 licensed to Demonstration School, 19 days remaining.

The sorted classes are shown in the Class Columns areas. Note the Class Column titles show the number of students in each column. The names are sorted alphabetically according to surname. The values in the Analysis Boxes at the bottom show the gender ratio, the average numeracy, literacy, behaviour and participation scores, as well as the number of friendless students and unsuitable matches. The average scores are calculated from the data in columns D to G in the student data file. A score of 3 represents a good mixture of student abilities. Values above 4 or below 2 are significantly different from the “average”. Of course, the averages will be affected by the overall ability scores of the entire group. To find out what the overall averages are, you can press the “Statistics” menu item button. For this data set, the statistics are shown below. Note the average values for the entire class set are all reasonably close to 3.



The class set shown when the program finished sorting is the last successful combination found, in this case combination 10. You can look at other class sets by pressing the up and down arrows next to “Show class set #” button. The Class Columns and Analysis Boxes will update accordingly.

For this sort, the multi-age option was set to “Off”, so the “Multi-age split” row is not applicable for this data. If we switch this value on to make multi-age composites with 2 age groups and a maximum age level of 75%, Class Maker will re-sort the classes and display new classes with the lowest year level ratio shown as a percentage of the class.

For multi-age classes containing 3 age levels, the row displays the actual class numbers (in this case years 3/4/5).

If you purchased the “Extended” version of Class Maker, you will also see the “Show Class E – H” button on the screen. Unsurprisingly, pressing this button will show classes 5 to 8 (if you requested them). They will display on the same screen with updated labels and statistics.

Sorting Efficiency

Class Maker 2018 has a “Sorting Efficiency” graph and a circle showing the number of “Friendless (students) per cycle” value. This gives you some real time feedback on how the sorting process is going. The value shown in the graph is related to the number of Essential and Incompatible students present in the data file. The higher the levels of both types, the lower the sorting efficiency will be and the longer Class Maker will take to find the required number of solutions. You should try to keep the number of Essential and Incompatible students below around 10% and 20% of the total student numbers respectively, especially if your student numbers are above 100. If you have inadvertently linked a student as “Essential” to one student, who is incompatible with a second, who happens to

be also essential to the first, the sorting efficiency will show as 0% and after a time Class Maker will alert you to this fact and ask you to check your data file.

The sorting efficiency value can also drop if you have manually set the Gender Ratio to be too low. It is good practice to set a value about 5% above the population value, for example if the cohort has a gender ratio of 55% females, then setting a value of 60% for the maximum gender ratio per class is a sensible level. Setting a level of 56% for the maximum ratio will be extremely unlikely to be met.

Friendless per cycle

If the sorting efficiency is high and Class Maker is still not finding any solutions, it may indicate that there are a large number of students who do not have 4 or 5 friends specified. If this is the case, then a high number will show up on the “Friendless per cycle” area. Some tips for using the number in the “Friendless per cycle” area are:

- If the value in the number of “Friendless per cycle” is over 10, it indicates that you do not have enough friends per student. You should try to add more friends (the more the better), especially for those students who only have 1 or 2 friends identified. You should also reduce the number of “Essential” and “Incompatible” students you have specified.
- If the value is around 3 to 8 consistently, you should still try to add more friends to the database if possible, however you could also try setting a low value for the “Number of Friendless” or “Incompatible pairs” under the “Sort Parameter” menu. Start with a value of 2 or 3 students initially, and see if Class Maker can find some solutions that you can tweak manually later.
- If the value shown is consistently 1 or 2, it may indicate that there is a situation where you are trying to force one student both **with** a particular group and forcing them **away** from the same group. Again, try allowing 1 friendless student or 1 incompatible pairing (in the Sort Parameters menu) and see if one particular student comes up consistently friendless or incompatible.

You should try to give every student a choice of 5 friends if possible. You could also try increasing the number of “Friendless” students in the Sort Parameters menu and tweak manually.

Tweaking Class Sets

Class Maker is designed to give you class sets which match your specific criteria, however it also allows you to alter the solutions it finds so you can fine tune your classes. If you find a solution using the up and down arrows which is almost what you want, but you think there may be a better solution, pressing the “Tweak Classes” button will bring up the current class set in a new window shown below. Note that all the students’ names are shown in black (this is a valid class set), the file name and sorting parameters are shown in the window title and that the statistics are all shown under the class lists for the list shown earlier.

The screenshot shows the Class Maker interface with three class sets: Class A (7), Class B (7), and Class C (6). The interface includes a sidebar with buttons for 'Save Classes', 'Re-start', 'Print', and 'Cancel'. Below these are filters for 'Friendless student', 'Incompatible in class', 'Friendless+incompatible', and 'No essential match', along with checkboxes for 'Accelerated', 'ESL', and 'Show Friends'. A 'School leavers' section is also present. The main area displays the student names for each class, and a statistics table is located at the bottom.

	Class A (7)	Class B (7)	Class C (6)
Mr. T	Andrew Aardvark Edward Emu Gerald Giraffe Hermione Horse Nancy Numbat Samantha Snake Tabitha Tortoise	Ms. A Darren Dog Ivan Iguana Jessica Jaguar Lisa Lemur Olive Ostrich Peter Pig Rebecca Rabbit	Miss. B Betty Butterfly Charlie Camel Francine Frog Kris Kangaroo Max Monkey Queen Quokka
Female %	57.1 %	57.1 %	50.0 %
Numeracy	3.28	2.71	3.5
Literacy	3	3.42	3.33
Behaviour	2.71	2.57	3
Participation	3	3.71	2.16
# friendless	0	0	0
# incompatible	0	0	0
Multi-age split	Not Applicable	Not Applicable	Not Applicable

The class lists can be changed using a familiar “Drag and Drop” technique. Simply click on the student you wish to move, drag them across the page, and drop them onto the class you would like to place them in. The class statistics will instantly update, as will the colours of the students’ names.

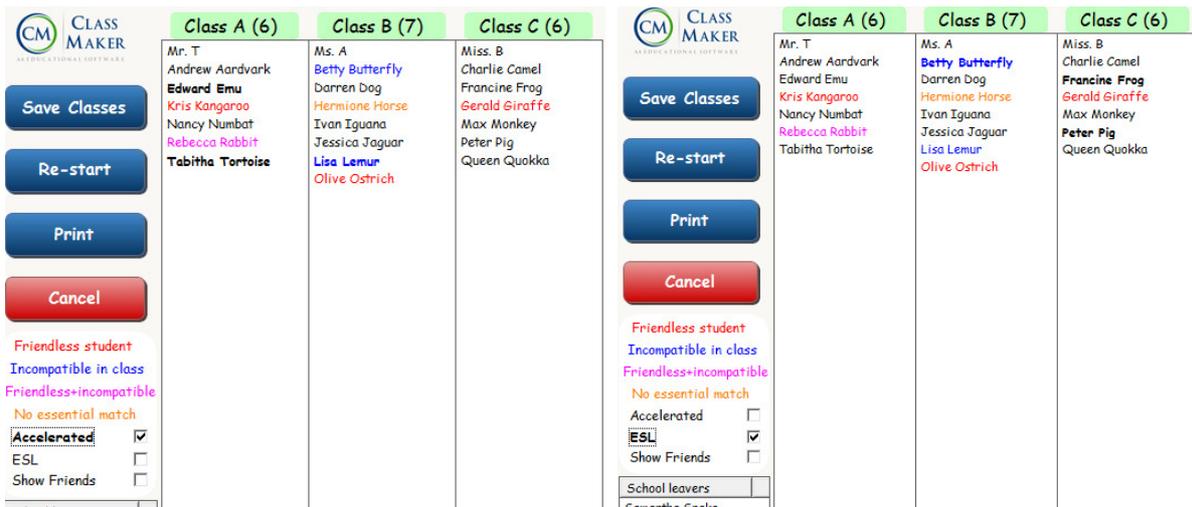
If you placed the student in a class where they no longer have a friend, their name will turn red (friendless student). If you put them in a class where they have an incompatible student pairing, that name will turn blue. If they have both their name will turn pink, and if any student had an “Essential” pairing which is no longer met, their name will turn orange. An example of this is shown below.

The screenshot shows the Class Maker 2016 interface with three class lists: Class A (6), Class B (7), and Class C (6). The interface includes a sidebar with buttons for 'Save Classes', 'Re-start', 'Print', and 'Cancel'. A legend indicates student status colors: red for 'Friendless student', blue for 'Incompatible in class', pink for 'Friendless+incompatible', and orange for 'No essential match'. There are also checkboxes for 'Accelerated', 'ESL', and 'Show Friends'. A 'School leavers' box contains 'Samantha Snake'. A summary table at the bottom provides statistics for each class.

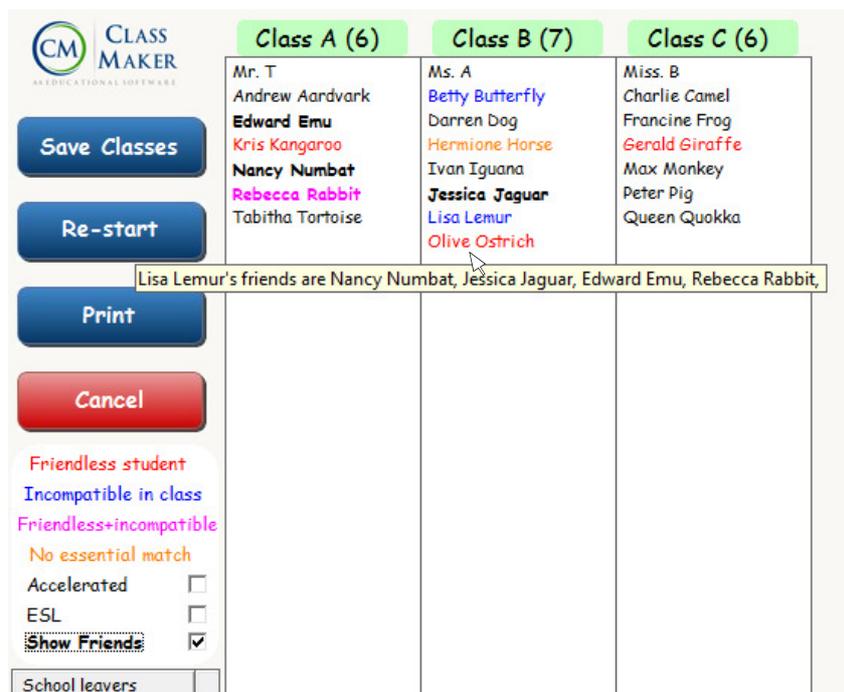
	Class A (6)	Class B (7)	Class C (6)
Mr. T	Andrew Aardvark	Ms. A	Miss. B
	Edward Emu	Betty Butterfly	Charlie Camel
	Kris Kangaroo	Darren Dog	Francine Frog
	Nancy Numbat	Hermione Horse	Gerald Giraffe
	Rebecca Rabbit	Ivan Iguana	Max Monkey
	Tabitha Tortoise	Jessica Jaguar	Peter Pig
		Lisa Lemur	Queen Quokka
		Olive Ostrich	
Female %	50.0 %	71.4 %	33.3 %
Numeracy	3.33	3.14	3.33
Literacy	2.33	3.71	3.66
Behaviour	3.16	2.42	2.66
Participation	3	3.42	2.5
# friendless	2	1	1
# incompatible	1	2	0
Multi-age split	Not Applicable	Not Applicable	Not Applicable

Users of Class Maker 2016 will notice a number of additional boxes in this window. Firstly, there is a box marked “School leavers”, which is where you can place students who will not be continuing at the school next year, but who was originally sorted with the class list. Dragging the student’s name to this box will update the class lists, showing anyone who is now without a friend due to the student leaving and updating the gender ratio and average ability levels for the class.

There are also some additional check boxes, where you can show the students who belong to a particular group identified in Columns H and I of the Excel template file. Checking either of these boxes highlights the student in **bold** (see below for an example). This feature can help ensure that members of either group are equally spread across the class lists or not.



The last new feature is the “Show Friends” check box. This can be useful to find the friends of the students to assist placing them into a new class without having to go back to the student database file every time. Ticking this box and then hovering the mouse over a student’s name shows the friends of that particular student in a small yellow box, and highlights the friends in bold in the main window (see below). Right clicking the mouse while hovering over the student name shows any Essential or Incompatible students of that student in the yellow box.



If you decide you would like to save the new “tweaked” class list, simply press the “Save Classes” button to save the data to file. Alternatively, you might like to print the data out so pressing the “Print” button will print out a low resolution copy of the page for later use. If you decide you’ve made too many changes and it’s too hard to go back manually, the “Re-start” button will let you start again. Pressing “Cancel” will bring you back to main page. **Note that any changes you make here will not change the class lists stored in the main page, so you must remember to save or print any of your tweaked data sets.**

Manually Sorting Classes

Class Maker also gives you the option to create your classes manually, bypassing the automatic sort processes completely but still allowing you to monitor friend requests, Incompatible student pairs and Essential student pairs. You can manually sort the classes by pressing the “Tweak Classes” button after opening your student database file.

Class Maker will then create a single class set and display the student names in the “Tweak Classes” window, which will allow you move the students between classes while the program tracks the number of friendless students, incompatible and essential pairs for you.

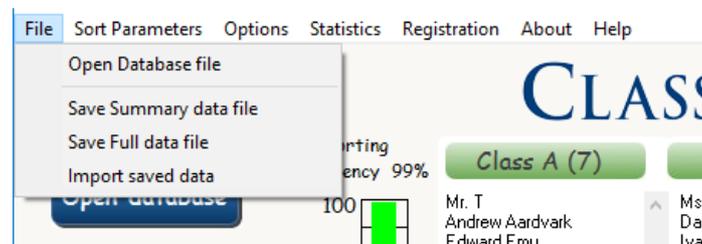
Saving Class Sets

While it might be nice to view the class sets in the program, in order to be useful you need to be able to save the data to file. You can save the class sets generated by Class Maker in 2 ways:

- “Summary” Data format, containing just the student names in the sorted class lists. This format is useful for the final Class Set.
- “Full” Data format, containing all the student data in the sorted class lists. This format is useful for sharing amongst other school staff and later editing or fine tuning prior to final approval.

Both file formats can be imported back into Class Maker for further fine tuning, however data saved in “Full” Data format is easier to import later. Note that this is a significant change from Class Maker 2016, where only the “Summary” Data format could be imported.

Class Maker outputs the class sets in .csv (comma separated variable) format which can be opened in Excel. Use the “File” menu button to bring up the menu items shown below.



Pressing the button for the data type you require (Summary or Full) brings up a box where you can type in the filename and directory for your sorted class sets. After the file is saved, double clicking the file in Explorer will open Excel and the data file.

The Summary data file looks like the figure below, where the widths of columns A, B and C have been increased to view the entire student names. This format should be used for the final Class Set.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Summary file for Class list 2017 template demo, 10 class sets, 3 classes.											
2	Class Set 1, 0 students with no friends, 0 incompatible student pairs.											
3	Class A, 28.6 % female, average Numeracy = 4.14, average Literacy = 3.28, average Behaviour = 2.71, average Participation = 3, Missing friends = 0 (),											
4	Class B, 71.4 % female, average Numeracy = 2, average Literacy = 3.14, average Behaviour = 2.57, average Participation = 3.71, Missing friends = 0 (),											
5	Class C, 66.7 % female, average Numeracy = 3.33, average Literacy = 3.33, average Behaviour = 3, average Participation = 2.16, Missing friends = 0 (),											
6	Class A (8)	Class B (8)	Class C (7)									
7	Mr. T	Ms. A	Miss. B									
8	Andrew Aardvark	Darren Dog	Betty Butterfly									
9	Edward Emu	Hermione Horse	Charlie Camel									
10	Gerald Giraffe	Jessica Jaguar	Francine Frog									
11	Ivan Iguana	Olive Ostrich	Max Monkey									
12	Kris Kangaroo	Peter Pig	Nancy Numbat									
13	Lisa Lemur	Rebecca Rabbit	Queen Quokka									
14	Tabitha Tortoise	Samantha Snake										
15												
16	Class Set 2, 0 students with no friends, 0 incompatible student pairs.											
17	Class A, 42.9 % female, average Numeracy = 2.85, average Literacy = 3, average Behaviour = 2.85, average Participation = 3.71, Missing friends = 0 (),											
18	Class B, 71.4 % female, average Numeracy = 2.85, average Literacy = 3.28, average Behaviour = 3, average Participation = 2.28, Missing friends = 0 (),											
19	Class C, 50.0 % female, average Numeracy = 3.83, average Literacy = 3.5, average Behaviour = 2.33, average Participation = 3, Missing friends = 0 (),											
20	Class A (8)	Class B (8)	Class C (7)									
21	Ms. A	Miss. B	Mr. T									
22	Darren Dog	Charlie Camel	Andrew Aardvark									
23	Jessica Jaguar	Francine Frog	Betty Butterfly									
24	Kris Kangaroo	Gerald Giraffe	Edward Emu									
25	Max Monkey	Hermione Horse	Ivan Iguana									

- Line 1 gives description of the type of data and the filename used (“Class list 2018 template demo”), the number of solutions found (10) and the number of classes in each (3).
- Line 2 shows the class set number (1), and a summary of friendless student numbers.
- Lines 3 to 5 show the averages for each class, which you can use to choose the best set from the options available.
- Lines 6 to 13 show the class lists. You can copy and paste these cells to any other program you like, eg into a table in Word, or keep the data in Excel format.
- Line 14 is a line space used to separate different class sets from each other.
- Line 15 is the same as line 2, only for class set 2. The cycle then repeats for all class sets.

The “Full” Data format looks like the figure below, and shows all the data entered into the student database file for each student sorted into the class sets. Use this data format for sharing classes with colleagues for later editing and fine tuning of the class lists.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R		
1	Full data file for Class list 2017 template demo, 10 class sets, 3 classes.																			
2	Student Name	Gender	Year Level	Numeracy	Literacy	Behaviour	Participator	Accelerated	ESL	Essential Frie	Friend 1	Friend 2	Friend 3	Friend 4	Friend 5	Incompati	Incompatible 2			
3	Class Set 1, 0 students with no friends, 0 incompatible student pairs.																			
4	Class A (8), 28.6 % female, average Numeracy = 4.14, average Literacy = 3.28, average Behaviour = 2.71, average Participation = 3, Missing friends = 0 (),																			
5	Mr. T	T	Andrew Aard Mr. T																	
6	Andrew Aardvark	M	2	3	5	2	3	Edward Emu Nancy Numb Betty Butt Ivan Iguan Darren Dog												
7	Edward Emu	M	2	5	3	3	3 Yes	Nancy Numb Ivan Iguan Rebecca R Queen Quokka												
8	Gerald Giraffe	M	2	5	5	1	3	Nancy Numb Betty Butt Ivan Iguan Darren Dog Darren Dog												
9	Ivan Iguana	M	2	3	5	1	5	Edward Emu Lisa Lemu Charlie Ca Andrew Aardvark												
10	Kris Kangaroo	M	2	4	1	5	3	Peter Pig Betty Butt Darren Do Ivan Iguana												
11	Lisa Lemur	F	2	5	3	5	1 Yes	Nancy Numb Jessica Jag Edward Er Rebecca Rabbit Charlie Ca Hermione Horse												
12	Tabitha Tortoise	F	2	4	1	2	3 Yes	Kris Kangaroo Betty Butt Lisa Lemu Edward Emu												
13																				
14	Class B (8), 71.4 % female, average Numeracy = 2, average Literacy = 3.14, average Behaviour = 2.57, average Participation = 3.71, Missing friends = 0 (),																			
15	Ms. A	T	Jessica Jaguar Ms. A																	
16	Darren Dog	M	2	3	5	1	5	Hermione Hc Tabitha Tc Francine F Jessica Jaguar												
17	Hermione Horse	F	2	2	3	3	3	Samantha Sn Betty Butterl Andrew A Darren Do Charlie Camel												
18	Jessica Jaguar	F	2	1	3	3	3	Olive Ostrich Nancy Numb Francine F Olive Ostr Darren Dog												
19	Olive Ostrich	F	2	5	3	3	4	Darren Dog Peter Pig Francine F Samantha Samantha Snake												
20	Peter Pig	M	2	1	2	3	5	Yes	Ivan Iguana Francine F Rebecca R Gerald Giraffe											
21	Rebecca Rabbit	F	2	1	3	2	3	Lisa Lemur Olive Ostr Francine F Max Monkey Tabitha Tortoise												
22	Samantha Snake	F	2	1	3	3	3	Jessica Jagua Kris Kanga Nancy Nui Darren Dog Ivan Iguana												
23																				
24	Class C (7), 66.7 % female, average Numeracy = 3.33, average Literacy = 3.33, average Behaviour = 3, average Participation = 2.16, Missing friends = 0 (),																			
25	Miss. B	T	Francine Frog Miss. B																	
26	Betty Butterfly	F	2	3	4	1	3	Yes	Nancy Numb Lisa Lemu Queen Ol Darren Dog Jessica Jaguar											

Importing Class Sets

Class Maker also allows you to import previously saved “Full” and “Summary” Data files so you can view the class lists or tweak them a little more. To do this, perform the following steps:

For files saved in “Full” Data format

1. Press “Import Saved Data” from the “File” menu
2. Click and open the saved class data file, this must be in csv format, not an Excel file

For files saved in “Summary” Data format

1. Open the student database file (the Excel file, not the saved class set file) as if you were going to make a new class set
2. Press “Import Saved Data” from the “File” menu
3. Click and open the saved class data file, this must be in csv format, not an Excel file

As you can see, importing the data in the “Full” Data format is easier than for the data saved in “Summary” Data format. You should now be able to tweak the saved class lists as before.

IMPORTANT:

In order to be able to import these data files for re-tweaking, it is important that the files are not changed in any way. Class Maker requires the files be in exactly the format it wrote them in, and if they are edited it will not be able to read them back again. If you do want to save a copy of the Summary or Tweaked data files, please make a copy and save them using a different file name and/or format.

Final thoughts

Hopefully this guide has helped you create your own sorted class lists. If not, or if you have any suggestions, bug fixes or improvements you would like to see, please contact the developers of the program and we’ll see if we can help solve your problems. The schools who used the program previously suggested many of the options available in Class Maker, if there is a specific feature you would like to see incorporated into future versions, please let us know.

When there are a large number of students in a class set, Class Maker can take a long time to find a valid solution. To understand why, consider that the total number of unique class sets that can be made by placing 100 students into 4 classes is $\frac{100!}{25!25!25!25!4!}$, which in numerical terms is 6.71753×10^{55} (or 67,175,312,842,324,100,000,000,000,000,000,000,000,000,000,000,000,000,000,000) possible different combinations! (Sorting 150 students into 6 classes gives 5.6975×10^{108} possible combinations). It therefore may be helpful to start the program allowing a few Friendless students and Incompatible pairings to help Class Maker reduce this total number to manageable levels.

If you have found the program useful, please tell your friends and colleagues about your experience!

Thanks.

Andrew

AA Educational Software

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