

# User's Manual

CFQZ

Version 1.25.1

## Worksheet Generator for Physics and Chemistry

Windows 7® - Windows 8® - Windows 10®



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## Introduction

**Worksheet Generator for Physics and Chemistry** is a Windows® software to create, save, load and print worksheets of Physics and Chemistry for educational purposes.

Please, read this manual carefully to learn all the capabilities of the software.

## Terms of use

In no event shall VaxaSoftware be liable to anyone for direct, indirect, special, collateral, incidental, or consequential damages by the use or impossibility of use of the software, nor by the effects in the operation of other software or the operating system.

Before the installation we recommended to make backup of your data and create a restoration point.

You will be able freely to evaluate the software during the time that considers necessary. Passed this period of evaluation you would have or to register it or uninstall it.

To register the software, please see the option "REGISTER APPLICATION" in the help menu of the software.

After paying the registry fee you will receive by email the REGISTRATION KEY of the software. Once registered the software, it will be able to use the options that were disabled until that moment.

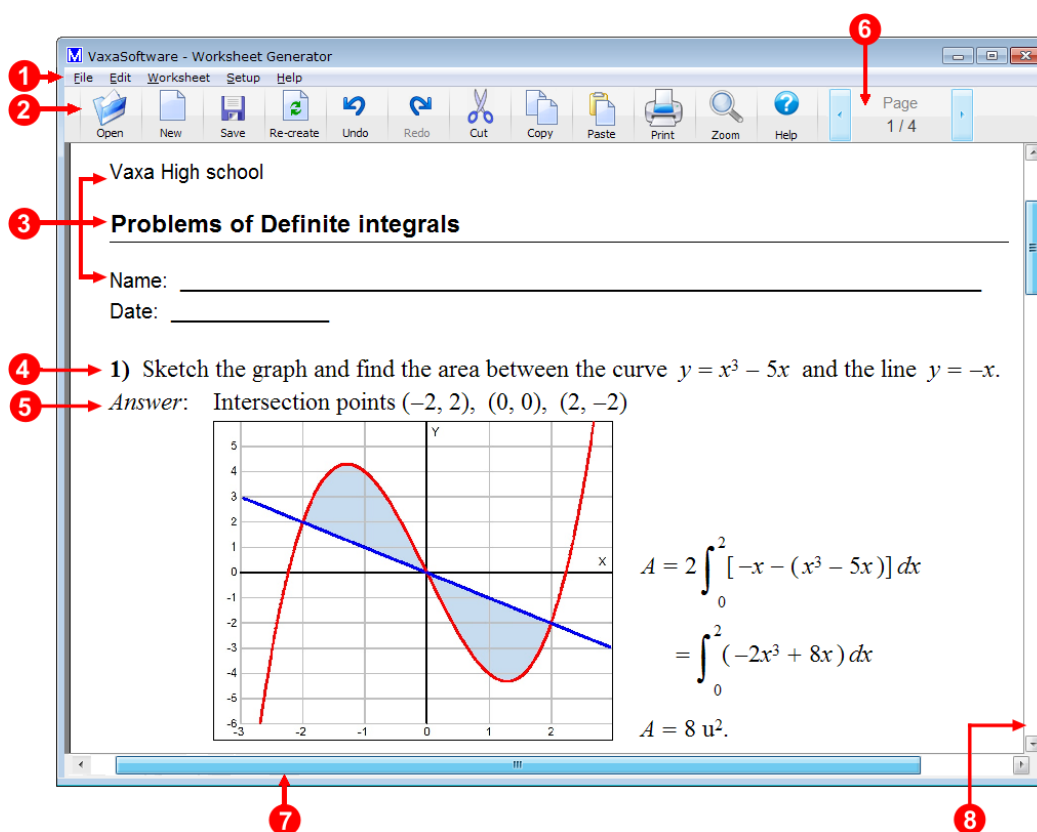
The REGISTRATION KEY is UNIQUE for EACH COMPUTER.

You cannot use the same REGISTRATION KEY for multiple computers.

You can freely distribute unaltered copies of the installation system of the software to other users. You cannot decompile the software nor use no type of reverse engineer for its analysis or modification. You cannot use part or the totality of the software to create a new software.

**Design, products, specifications, and prices are for information purposes only. VaxaSoftware reserves the right to change or modify design, products, specifications, and prices at any time without prior notice.**

## Main window



### 1 Menu bar

It contains the menus: **File**, **Edit**, **Worksheet**, **Setup** and **Help**.

### File menu

#### **New worksheet...** menu

Opens the **Wizard** window that will help us create a new worksheet.

#### **Open...** menu

Opens the dialog window to select and open a worksheet file (\*. col).

#### **Create custom worksheets for a group of students...** menu

Allows us create custom worksheets for a group of students based on the current document. The list of students must be a text file with one name per line.

#### **Save** menu

Saves the current worksheet. If the worksheet is new or has been re-created, will be saved as a new file and we asked for a file name and a path to save it.

#### **Save as...** menu

Shows the dialog window to select a path and a filename (\*. col) to save the current worksheet.

**Print... menu**

Opens the **Print** window. In it we can select the printer destination and specify the pages we want to print and the number of copies.

**Print all worksheets from a folder... menu**

Allows us print the worksheets from a folder.

**<List of recent files> menu**

Lists recent files opened or saved. To open a file click on its name.

**Exit menu**

Closes the application.

## **Edit menu**

**Undo menu**

Undoes last action.

**Redo menu**

Returns to the state before last Undo.

**Cut menu**

Copies selected problem into the clipboard and deletes it.

**Copy menu**

Copies selected problem into the clipboard.

**Paste menu**

Inserts the problem from the clipboard into the worksheet.

**Delete menu**

Erases the selected problem.

**Move to menu**

Moves the selected problem to another position.

**Move to the beginning menu**

Moves to the top the selected problem.

**Move to the end menu**

Moves to the end the selected problem.

**Move up menu**

Moves up one position the selected problem.

**Move down menu**

Moves down one position the selected problem.

**Activate extra spacing menu**

Shows additional space after the statement of the selected problem or shows additional space between the items of the selected exercise that has this option.

**Disable extra spacing menu**

Hide the additional space after the statement of the selected problem or hide the additional space between the items of the selected exercise that has this option.

**◆ Note**

The extra spacing only applies to problems or exercises that have this option.

### **Re-create problem** menu

Re-creates the selected problem.

The created problem will be of the same type but with other data and/or statement.

The new problem replaces the selected one.

### **Insert another similar problem** menu

Creates another problem of the same type that the selected one.

The created problem will be of the same type but with other data and/or statement.

The new problem will be inserted in the position of the selected one.

### **Edit...** menu

Opens the **Edit** window. In it we can modify the current exercise and insert new exercises.

## **Worksheet** menu

### **Re-create worksheet** menu

Creates another worksheet and replaces the current worksheet.

The new re-created worksheet will be of the same type of problems but with other data and/or statements.

#### ◆ **Note**

This new re-created worksheet is assumed as a new file.

### **No answers** menu

Hides the answers of the problems.

### **Answers after each problem** menu

Puts the answers of each problem after the statement of each one.

### **Answers together at the end** menu

Puts the answers of problems all together at the end of the worksheet.

### **Answers on a separate page** menu

Puts the answers of problems together in new pages at the end of the worksheet.

### **Activate extra spacing globally** menu

Shows additional space after the statement of each problem of the worksheet or shows additional space between the items of each exercise of the worksheet that has this option.

### **Disable extra spacing globally** menu

Hide the additional space after the statement of each problem of the worksheet or hide the additional space between the items of each exercise of the worksheet that has this option.

#### ◆ **Note**

The extra spacing only applies to problems or exercises that have this option.

### **Worksheet properties...** menu

Opens the **Worksheet properties** window to change general properties of the current worksheet.

→ See **Worksheet properties** window for further details.

## **Setup** menu

### **Show Editing buttons** menu

Shows / hides editing buttons: **Undo**, **Redo**, **Cut**, **Copy** and **Paste**.

### **Zoom** menu

Allows us set size of the current worksheet.

The following settings are available:

- **Fit to window's width** - 50%
- **75%** - 100%
- **150%** - 200%.

### **Worksheet properties...** menu

Opens the **Worksheet properties** window to change general properties of the current worksheet.

→ See **Worksheet properties** window for further details.

### **Application setup...** menu

Opens the **Application setup** window to change properties of the software.

→ See **Application setup** window for further details.

## Help menu

### **User's Manual (PDF document)...** menu

Shows this manual.

### **Application registration** menu

Shows the **Registration form** window to register the application.

### **Disabled functions in the non-registered version** menu

Shows the list of disabled functions when the application is not registered.

### **Home page: www.vaxasoftware.com...** menu

Connects to **VaxaSoftware** home page.

An active Internet connection and a browser are required.

### **Contact us...** menu

Connects to **VaxaSoftware** contact page.

An active Internet connection and a browser are required.

### **Updates** menu

#### **Check now...** menu

The software connects to Internet to check for updates.

An active Internet connection is required.

#### **Ckecking period...** menu

Allows us to adjust the period between checks for updates.

The following settings are available:

- **Once a day.**
- **Once a week.**
- **Once a month.**

### **About...** menu

Shows the **Splash** window with the version and description of the application.

## 2 Buttons bar

### **Open** button

→ See **File / Open** menu for further details.

### **New** button

→ See **File / New worksheet** menu for further details.

### **Save** button

→ See **File / Save** menu for further details.

### **Re-create** button

This button can either re-creates a selected problem or the whole worksheet.

- 1) If nothing is selected the whole worksheet is re-created.  
The new worksheet replaces the old one and is considered as a new file.  
The new re-created worksheet has the same type of problems but with other data and/or statements.
- 2) If there is a selected problem a new problem is re-created.  
This new problem replaces the old selected one. The new problem is similar type but with other data and/or statements.

### **Undo** button

→ See **Edit / Undo** menu for further details.

### **Redo** button

→ See **Edit / Redo** menu for further details.

### **Cut** button

→ See **Edit / Cut** menu for further details.

### **Copy** button

→ See **Edit / Copy** menu for further details.

### **Paste** button

→ See **Edit / Paste** menu for further details.

### **Print** button

→ See **File / Print** menu for further details.

### **Zoom** button

→ See **View / Zoom** menu for further details.

### **Help** button

→ See **Help** menu for further details.

## **3 Educational center, title, and additional text**

Shows us the Educational Center, the title of the worksheet, and additional text  
We can change these items clicking on the **Worksheet / Worksheet properties...** menu.

→ See **Worksheet properties** window for further details.

## **4 Statement of the problem**

Problem number and its statement.

→ We can select a problem clicking on it with the main button of the mouse.  
Then we can edit it using the **Edit** menu options.  
Also we can access the **Edit** menu options clicking the secondary button of the mouse when a problem is selected.

→ See **Edit** menu for further details.

We can change the style of the problems number (initial number, prefix, suffix and color).  
To change the problem number properties we access the properties of the worksheet clicking on the **Worksheet / Worksheet properties...** menu.



## 5 Answer of the problem

Shows us the answer of the problem.

The answer of a problem can be hidid / shown and changed of place.

→ See **Worksheet** menu for further details.

## 6 Page scroll bar

Shows us the number of the current page and the total pages of the worksheet.

We can press buttons on the left and right side of the page number to access to the previous or next page. Also we can press **Page Up** and **Page Down** cursor keys.

To access to the first page we can press the **Home** cursor key, to access to the end one we press the **End** cursor key.

### ◆ Note:

Page numbers shown are ordinals numbers. If our pages are numbered and the first number isn't 1 then the page number that appears on the page does not match that shown in the bar.

### Example:

If the first page of our worksheet is numbered from 15 to 18 the displayed numbers will be the following:

Page 15 is shown as **Pag. 1/4** .

Page 16 is shown as **Pag. 2/4** .

Page 17 is shown as **Pag. 3/4** .

Page 18 is shown as **Pag. 4/4** .

## 7 Horizontal scroll bar

Allows us move current page horizontally if that does not fit entirely in the window.

Also we can press **Left** ← and **Right** → cursor keys.

## 8 Vertical scroll bar

Allows us move current page vertically if that does not fit entirely in the window.

Also we can press **Up** ↑ and **Down** ↓ cursor keys.

## Wizard window

The **Wizard window** allows us select the subject, topics, types and amount of problems we want create.

We have two ways to start the **Wizard window**:

- 1) Clicking on the **File / New worksheet** menu in the **Main window**.
- 2) Clicking on the **New** button in the **Main window**.

We can move through the **Wizard window** pressing **Back** and **Next** buttons.  
To close the **Wizard window** click on **Cancel** button.

The **Wizard window** has the following panels:

- **Welcome panel**
- **Select the subject panel**
- **Types of documents panel**
- **Select topics, types and amount of problems panel**
- **Problem numbers / Page numbers panel**
- **Position of the answers / Sorting method panel**
- **Educational center, title, and additional text panel**

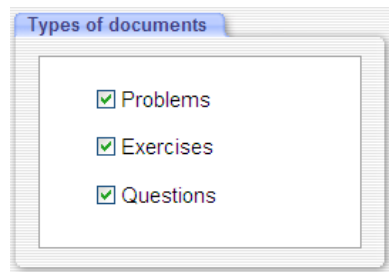
### Welcome panel

Gives us a brief description of the Wizard.

### Select the subject panel

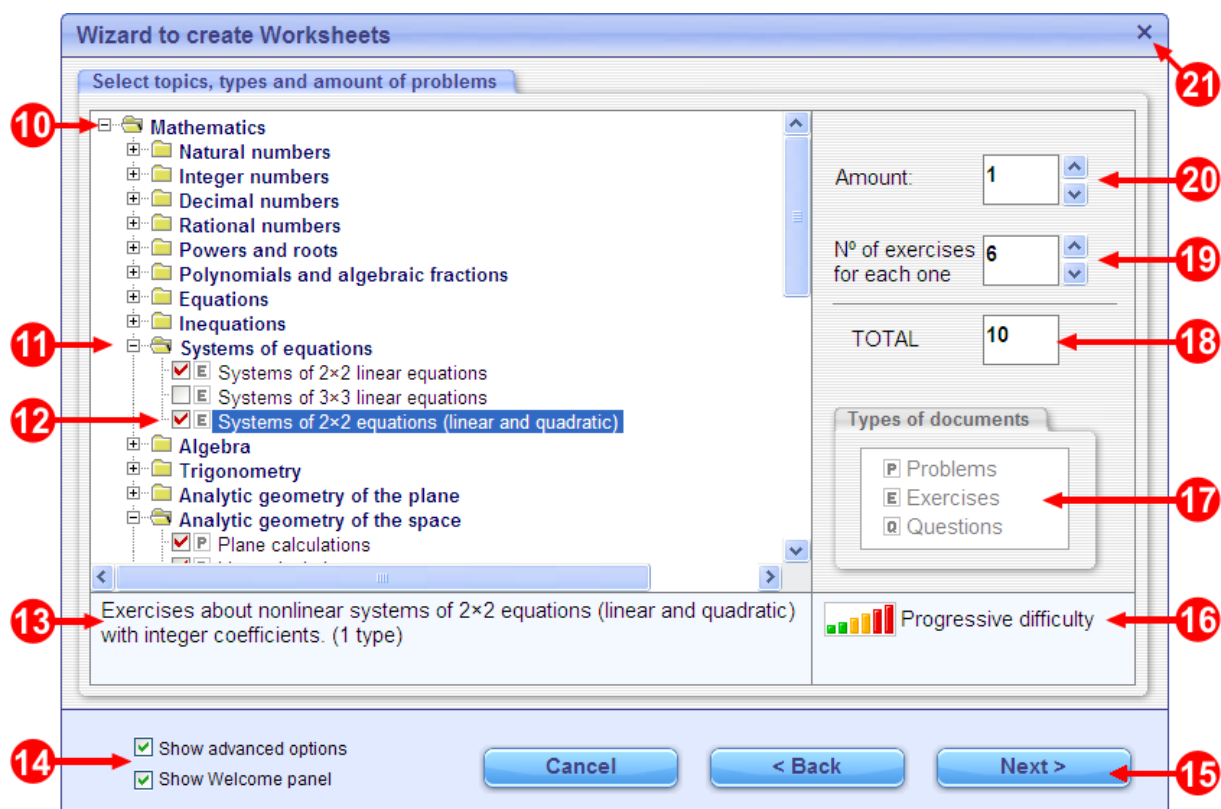
Allows us select the subject of the problems we want create.

### Types of documents panel



Lets us filter the types of documents: **Problems, exercises** or **questions**.

## Select topics, types and amount of problems panel



### 10 Subject folder

Displays the name of the subject previously selected.

### 11 Topic folder

Displays the name of the topic.

### 12 Type of document mark: Problem, Exercise, Question

Shows the name and type of document according to the mark to the left of each name: [P] Problems, [E] Exercises, [Q] Questions.

### 13 Description of the current problem

Displays extended information about the problem, exercise or question selected.

### 14 View options

Allows us show or hide panels of the **Wizard** window:

#### Show advanced options

When this option is activated we can access the followings panels:

- Types of documents panel.
- Problem numbers / Page numbers panel.
- Position of the answers / Sorting method panel.

#### Show Welcome panel

When this option is activated the Welcome panel of the **Wizard** window is shown.

## 15 Buttons

### Cancel button

Closes the **Wizard** window.

### Back button


Shows previous panel of the **Wizard** window.

### Next button

Shows next panel of the **Wizard** window.

## 16 Difficulty level mark

Indicates the difficulty level of the selected problem. The difficulty level may be:

Progressive difficulty: 

 Low difficulty

 Medium difficulty

 High difficulty

### ◆ Note

The **Difficulty Progressive** function does not work if the worksheet is created when the **Unsorted** option is activated in the → [Sorting method](#) panel.

## 17 Legend about Types of documents

Shows the type of document according to the mark to the left of each:

[P] Problems, [E] Exercises, [Q] Questions.

## 18 Total amount of documents (problems)

Shows the total number of documents (problems, exercises and questions) selected.

### ◆ Note

We cannot create more than 500 problems in a single worksheet.

If we need more than 500 problems, we have to distribute them in various worksheets with 500 or less problems in each one.

## 19 Amount of elements in each exercise or question

If the document type is exercise or question, we can specify the number of items we want to create within each.

The elements are sorted alphabetically from **a** to **z** (26 elements is the maximum amount).

The default amount is 6.

The minimum amount is 2.

The maximum amount is generally 26.

## 20 Amount of problems (exercise or question)

It allows us specify the amount of problems we want to create of the selected type.

The default amount is 1.

The maximum amount is 99.

## 21 Close button

Closes the **Wizard** window.

## Position of answers / Sorting method panel

Position of answers

No answers

After each problem

Together at the end

On a separate page

Problem Answer

Problem Answer

Problem Answer

Problem Answer

### Position of answers

Specifies four options for the position of the answers:

- No answers
- Answers after each problem
- Answers together at the end
- Answers on a separate page

→ See Worksheet menu for further details.

Sorting method

Sorted by topics

Unsorted

### Sorting method

Allows us sort the problems by topics or randomly (unsorted).

#### ◆ Note

The **Difficulty Progressive** function does not work if **Unsorted** option is activated.

## Problem numbers / Page numbers panel

Problem numbers

Prefix Start at Suffix

1

Highlight color for problem number

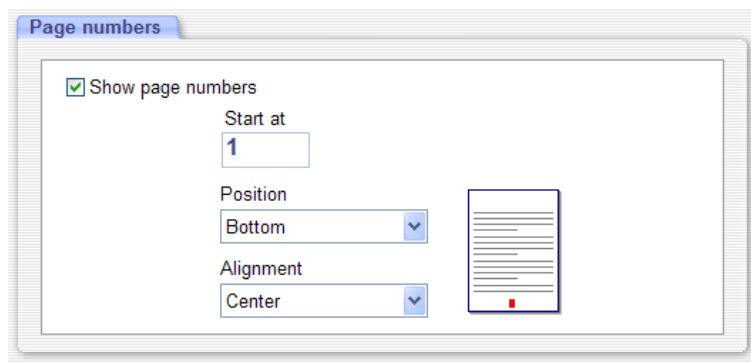
### Problem numbers

Sets the following four properties for the number of the problems:

- Prefix:** Text that appears to the left of the number of each problem.  
Default is empty.
- Suffix:** Text that appears to the right of the number of each problem.  
Default is a close parenthesis.
- Start at:** Initial problem number (default is 1).
- Highlight color:** Background color of the problem number text (default is white).

#### ◆ Note

The initial number must be less than 2000.



### Page numbers

Sets the position of page number and its initial value:

**Show page numbers:** Click on this option to turn on/off page numbering.

**Start at:** Specifies the initial number (default is 1).

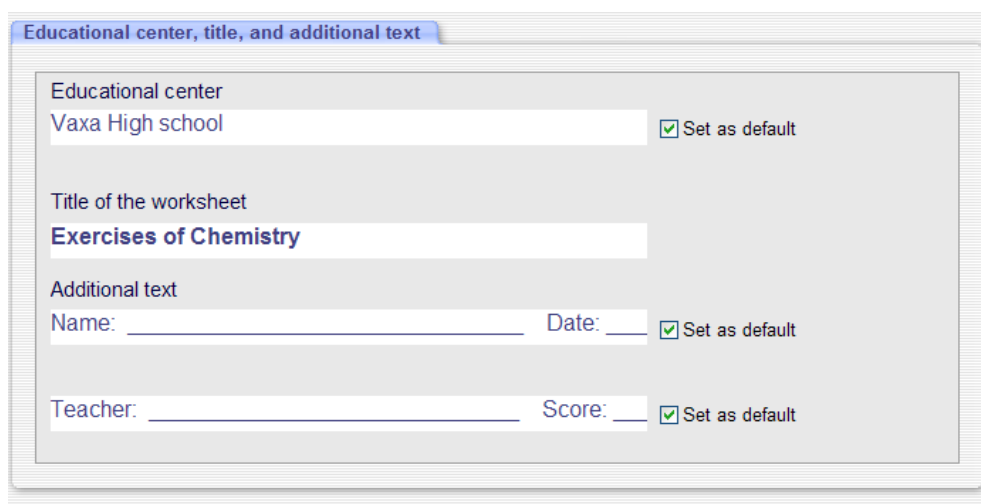
**Position:** Sets the placement of the page number:  
 - Up  
 - Down.

**Alignment:** Specifies the alignment of the page number:  
 - Left  
 - Center  
 - Right  
 - Inside  
 - Outside

#### ◆ Note

The initial number must be less than 2000.

### Educational center, title, and additional text panel



Allows us specify the text that leads all the pages of the worksheet.

Allows us specify **Educational Center**, **Title of the Worksheet**, and **Additional text**. These lines of text will appear in the header of each page of the worksheet.

**Set as default** option:

Sets as default the corresponding text so that it is automatically included in the subsequent worksheets without the need to rewrite it.

## Worksheet properties window

The **Worksheet properties** window allows us modify the properties of the current worksheet.

To access the **Worksheet properties** window click on **Worksheet / Worksheet properties...** menu in the **Main** window.

This window has the following panels:

- **Educational center, title, and additional text** panel
- **Sorting method** panel
- **Position of answers** panel
- **Problem numbers** panel
- **Page numbers** panel

### Educational center, title, and additional text panel

The screenshot shows a dialog box titled "Educational center, title, and additional text". It contains four input fields, each with a "Set as default" checkbox to its right:

- Educational center:** The text "Vaxa High school" is entered in the field.
- Title of the worksheet:** The text "Exercises of Chemistry" is entered in the field.
- Additional text:** The text "Name: \_\_\_\_\_ Date: \_\_\_\_" is entered in the field.
- Teacher:** The text "Teacher: \_\_\_\_\_ Score: \_\_\_\_" is entered in the field.

Allows us specify the text that leads all the pages of the worksheet.

Allows us specify **Educational Center**, **Title of the Worksheet**, and **Additional text**. These lines of text will appear in the header of each page of the worksheet.

**Set as default** option:

Sets as default the corresponding text so that it is automatically included in the subsequent worksheets without the need to rewrite it.

### Sorting method panel

The screenshot shows a dialog box titled "Sorting method". It contains two radio button options:

- Sorted by topics
- Unsorted

Allows us sort the problems by topics or randomly (unsorted).

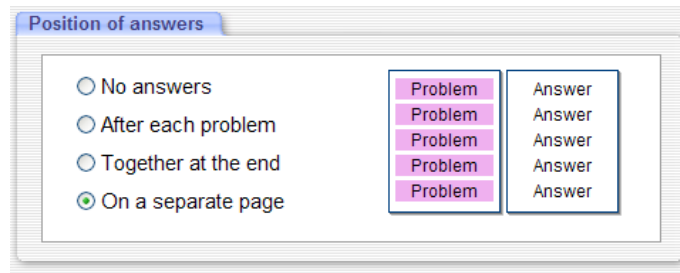
#### ◆ Note 1

We cannot re-sort a worksheet that was created with the **Unsorted** option activated.

#### ◆ Note 2

The **Difficulty Progressive** function does not work if **Unsorted** option is activated.

## Position of answers panel

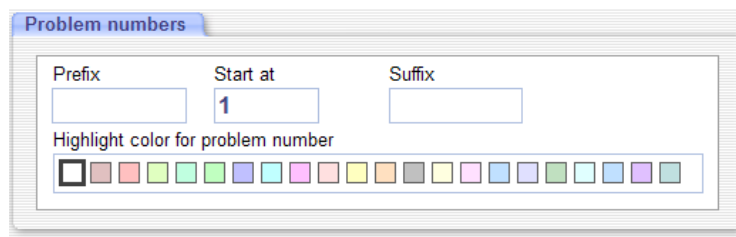


Specifies four options for the position of the answers:

- No answers
- Answers after each problem
- Answers together at the end
- Answers on a separate page

→ See Worksheet menu in Main windows for further details.

## Problem numbers option



Sets the following four properties for the number of the problems:

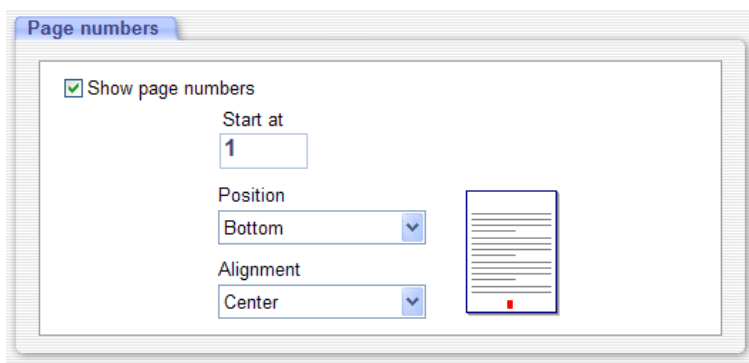
- Prefix:** Text that appears to the left of the number of each problem. Default is empty.
- Suffix:** Text that appears to the right of the number of each problem. Default is a close parenthesis.
- Start at:** Initial problem number (default is 1).
- Highlight color:** Background color of the problem number text (default is white).

### ◆ Note

The initial number must be less than 2000.



## Page numbers panel



Sets the position of page number and its initial value:

**Show page numbers:** Click on this option to turn on/off page numbering.

**Start at:** Specifies the initial number (default is 1).

**Position:** Sets the placement of the page number:  
- Up  
- Down.

**Alignment:** Specifies the alignment of the page number:  
- Left  
- Center  
- Right  
- Inside  
- Outside

### ◆ Note

The initial number must be less than 2000.

## Application setup window

The **Application setup** window allows you to modify various parameters of the application.

To access this window click on the **Setup / Application setup...** menu in the **Main** window.

This window has the following panels:

- Educational Center, title, and additional text.
- Educational system.
- Problems numbers.
- Page Numbers.
- Position of answers.
- Sorting method.
- Decimal and list separators.
- Multiplication and division signs.
- Scientific notation.
- Notation for intervals.
- Notation for statistics.
- Currency.
- Geometrical optics: Sign convention for mirrors.
- Geometrical optics: Sign convention for lenses.
- Wizard window options.
- Editing buttons.

## Shortcut keys

List of keyboard shortcuts available in the **Main** window.

<b>Ctrl + N</b>	New worksheet
<b>Ctrl + O</b>	Open
<b>Ctrl + S</b>	Save
<b>Ctrl + P</b>	Print
<b>Ctrl + F4</b>	Exit
<b>Alt + F4</b>	Exit
<b>Ctrl + R</b>	Re-create worksheet
<b>Ctrl + Z</b>	Undo
<b>Ctrl + Y</b>	Redo
<b>Ctrl + X</b>	Cut
<b>Ctrl + C</b>	Copy
<b>Ctrl + V</b>	Paste
<b>Del</b>	Delete
<b>Ctrl + E</b>	Re-create selected problem
<b>Ctrl + I</b>	Insert a similar problem to the selected one
<b>F1</b>	Help / User's Manual (PDF document...)
<b>F2</b>	Move up selected problem
<b>F3</b>	Move down selected problem
<b>F4</b>	Open <b>Worksheet Properties</b> window
<b>Up arrow</b>	Move down current page
<b>Down arrow</b>	Move up current page
<b>Left arrow</b>	Move right current page
<b>Right arrow</b>	Move left current page
<b>Page Up</b>	Access to previous page
<b>Page Down</b>	Access to next page
<b>Home</b>	Access to first page
<b>End</b>	Access to last page

## List of subjects, topics and types of problems

### ◆ Note

<R> Only available in the registered version.

Blue text: New in this version.

## Physics

### Unit conversion

Mass conversion (metric)

Length conversion (metric)

Time conversion

Area conversion I (metric)

<R> Area conversion II: Square meter and hectare

<R> Volume conversion I: (metric)

<R> Volume conversion II (metric)

<R> Volume conversion III (metric)

Temperature conversion I (Celsius - Fahrenheit)

<R> Temperature conversion II (Celsius - Fahrenheit - Kelvin)

<R> Length conversion (metric - imperial)

<R> Mass conversion (metric - imperial)

Convert radians to degrees

Convert degrees to radians

### Vector calculus

<R> Gradient

<R> Divergence

<R> Curl

### Kinematics: Motion in 1 dimension

Velocity unit conversion

Motion with constant velocity

Motion with constant acceleration

<R> Meeting and pursuit

### Kinematics: Motion in 2 dimensions

<R> Objects launched horizontally

<R> Objects launched obliquely

<R> Uniform circular motion

<R> Tangential and normal components of the acceleration

### Dynamics

Block on a horizontal surface

<R> Dynamics of two or three objects connected by cords

<R> Hooke's Law word problems

<R> Centripetal force

### Pressure and hydrostatics

Basic pressure calculations

<R> Static fluid pressure

<R> Pascal's principle (hydraulic lift)

<R> Archimedes' principle

### Work, energy, power and momentum

<R> Momentum and collisions

<R> Work done by constant force

Kinetic Energy and Potential Energy I

<R> Kinetic Energy and Potential Energy II

<R> Spring force and spring energy

<R> Specific heat

<R> Specific and latent heat

### Gravitational field

Basic calculations

<R> Gravitational field and force for multiple point masses

<R> Orbits I: Kepler's third law

<R> Orbits II: Kinematics and dynamics

## Physics (concluded)

### Electric field

- Basic calculations
- Electric force and field for multiple point charges
- <R> Electric potential and work

### Electric circuits

- Basic calculations
- <R> Resistors in series and parallel combination
- <R> Capacitors in series and parallel combination
- <R> Power and energy consumed by resistors
- <R> Energy stored in capacitors
- <R> Kirchoff's Laws I
- <R> Kirchoff's Laws II
- <R> Kirchoff's Laws III
- <R> Diode current limiting resistor
- <R> Passive Low/High Pass Filters (RL and RC)
  - [Series RL, RC, RLC AC circuits \(I\)](#)
- <R> [Series RL, RC, RLC AC circuits \(II\)](#)

### Magnetic field

- <R> Magnetic field/force of straight wires
- <R> Motion of charges in magnetic fields
- <R> Magnetic induction
- <R> Transformers

### Simple Harmonic Motion (S.H.M.)

- <R> Kinematics of Simple Harmonic Motion
- <R> Dynamics of Simple Harmonic Motion
  - Energy of Simple Harmonic Motion

### Mechanical waves

- <R> Wave equation in one dimension

### Sound

- <R> Doppler Effect
- <R> Sound Intensity and Sound Level

### Optics

- <R> Light and electromagnetic waves
  - Refraction
- <R> Geometric optics: Spherical mirrors
- <R> Geometric optics: Thin lenses

### Special relativity

- <R> Special relativity

### Quantum mechanics

- <R> Photoelectric effect
- <R> Emission spectrum of hydrogen atom

### Nuclear physics

- <R> Nuclear reactions
  - Nuclear mass and binding energy
- <R> Nuclear disintegration

#### ◆ Note

- <R> Only available in the registered version.
- Blue text:** New in this version.

## Chemistry

### Units and chemical formulae

- Grams and moles conversions
- Grams, moles, molecules, and atoms conversions
- <R> Percent composition
- <R> Determining empirical formula
- <R> Determining empirical and molecular formula (without combustion)
- <R> Determining empirical and molecular formula (with combustion)
  - Mass conversion (metric)
  - Length conversion (metric)
  - Time conversion
  - Area conversion I (metric)
- <R> Area conversion II: Square meter and hectare
- <R> Volume conversion I: (metric)
- <R> Volume conversion II (metric)
- <R> Volume conversion III (metric)
  - Temperature conversion I (Celsius - Fahrenheit)
- <R> Temperature conversion II (Celsius - Fahrenheit - Kelvin)
- <R> Length conversion (metric - imperial)
- <R> Mass conversion (metric - imperial)

### Gases

- Problems of ideal gases I
- <R> Problems of ideal gases II
- <R> Problems of ideal gases III (Dalton's Law)

### Solutions

- Aqueous solutions I
- <R> Aqueous solutions II
- <R> Aqueous solutions III
- <R> Aqueous solutions IV: Dilutions
- <R> Colligative properties of solutions (I)
- <R> Colligative properties of solutions (II)

### Stoichiometry of chemical reactions

- Balancing chemical equations
- Simple stoichiometry of reactions I (pure reagents)
- Simple stoichiometry of reactions II (impure reagents)
- <R> Simple stoichiometry of reactions III
- <R> Simple stoichiometry of reactions IV
- <R> Percent yield of reaction
- <R> Limiting reagents in stoichiometry

### Thermochemistry

- <R> Specific heat
- <R> Specific and latent heat
  - Internal energy and enthalpy
- <R> Enthalpy of reaction
- <R> Hess's Law
- <R> Average bond enthalpies
- <R> Gibbs free energy and spontaneity
- <R> Born-Haber Cycle

### Chemical kinetics

- Basic calculations in chemical kinetics
- <R> Rate law of reaction
- <R> Arrhenius Equation
- <R> Potential energy diagram

## Chemistry (continued)

### Gas phase equilibria

- Basic calculations
- Le Châtelier's principle
- <R> Calculation of the equilibrium constant
- <R> Calculation of composition at equilibrium

### Acid-base equilibria

- <R> Completing acid-base equations
- <R> Acidic, basic and amphoteric compounds
  - Strong acids and bases
- <R> Weak acids I
- <R> Weak acids II
- <R> Weak bases I
- <R> Weak bases II
- <R> Aqueous solutions of salts (acidic, basic or neutral)
- <R> Salt hydrolysis
- <R> Buffer solutions
- <R> Acid-base titrations

### Solubility equilibria

- <R> Solubility product constant and solubility in pure water
- <R> Solubility in the presence of a common-ion

### Redox reactions

- Basic concepts and calculations
- <R> [Balancing redox half-reactions in acidic solution](#)
- <R> [Balancing redox half-reactions in basic solution](#)
- <R> Balancing oxidation-reduction equations in an acidic medium
  - Balancing oxidation-reduction equations in a basic medium
- <R> Balancing oxidation-reduction equations in acidic or basic medium
- <R> Stoichiometry of redox reactions
- <R> Redox titrations
- <R> Galvanic cell
- <R> Electrolysis I
- <R> Electrolysis II

### Atomic structure

- <R> Number of protons, neutrons, and electrons for atoms
- <R> Number of protons, neutrons, and electrons for ions
- <R> Number of protons, neutrons, and electrons for atoms and ions
  - Quantum numbers I
  - Quantum numbers II
  - Quantum numbers III
  - Quantum numbers IV
- <R> Electron configuration, group #, and period #
- <R> Electron configuration, periodic properties, formula and type of bond
- <R> Ranking elements/ions according to radius
- <R> Light: Frequency, wavelength, and energy
- <R> Photoelectric effect
- <R> Emission spectrum of hydrogen atom
- <R> Average atomic mass and isotopic abundances
- <R> Nuclear reactions
  - Nuclear mass and binding energy
- <R> Nuclear disintegration

### Molecular structure

- <R> Lewis dot structure
- <R> Lewis dot structure and molecular geometry

## Chemistry (continued)

### Nomenclature of inorganic compounds

- W: Elements
- N: Elements
- W: Monoatomic ions
- N: Monoatomic ions
- W: Oxides
- N: Oxides
- W: Peroxides
- N: Peroxides
- W: Oxides and peroxides
- N: Oxides and peroxides
- W: Hydrides
- N: Hydrides
- W: Hydroxides
- N: Hydroxides
- <R> W: Hydrogen halides and their salts. Nonmetal-nonmetal salts
- <R> N: Hydrogen halides and their salts. Nonmetal-nonmetal salts
- <R> W: Oxyacids
- <R> N: Oxyacids
- <R> W: Neutral salts derived from oxyacids
- <R> N: Neutral salts derived from oxyacids
- <R> W: Acid salts derived from oxyacids
- <R> N: Acid salts derived from oxyacids
- <R> W: Polyatomic ions
- <R> N: Polyatomic ions

### Organic nomenclature. Hydrocarbons

- D: Linear and branched chains of alkanes
- N: Linear and branched chains of alkanes
- <R> D: Linear and branched chains of alkenes
- <R> N: Linear and branched chains of alkenes
- <R> D: Linear and branched chains of alkenes and alkynes
- <R> N: Linear and branched chains of alkenes and alkynes
- <R> D: Cycloalkanes/alkenes/alkynes and benzene derivatives
- <R> N: Cycloalkanes/alkenes/alkynes and benzene derivatives

### Organic nomenclature. Oxygen-containing

- <R> D: Alcohols
- <R> N: Alcohols
- <R> D: Ketones
- <R> N: Ketones
- <R> D: Aldehydes
- <R> N: Aldehydes
- <R> D: Ethers
- <R> N: Ethers
- <R> D: Phenols
- <R> N: Phenols
- <R> D: Acids
- <R> N: Acids
- <R> D: Esters
- <R> N: Esters
- <R> D: Multiple oxygen functional groups
- <R> N: Multiple oxygen functional groups
- <R> D: ALL functional groups containing oxygen
- <R> N: ALL functional groups containing oxygen



## Chemistry (*concluded*)

### Organic nomenclature. Nitrogen-containing

- <R> D: Amines
- <R> N: Amines
- <R> D: Amides
- <R> N: Amides
- <R> D: Nitriles
- <R> N: Nitriles
- <R> D: Nitro compounds
- <R> N: Nitro compounds
- <R> D: Multiple nitrogen (oxygen) functional groups
- <R> N: Multiple nitrogen (oxygen) functional groups
- <R> D: ALL functional groups containing nitrogen (and oxygen)
- <R> N: ALL functional groups containing nitrogen (and oxygen)

### Organic chemistry

- <R> Hybridization state of carbon atoms
- <R> Chain isomers
- <R> Position isomers
- <R> Functional isomers
- <R> Geometric isomers
- <R> Optical isomers
- <R> All types of isomers
- <R> Organic reactions

#### ◆ Note

<R> Only available in the registered version.

**Blue text:** New in this version.

## Specifications

<b>Description</b>	<b>Worksheet Generator for Physics and Chemistry</b> is a Windows® software to create, save, load and print worksheets of Physics and Chemistry for educational purposes.
<b>Maximum amount of problems in a worksheet</b>	500
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<b>Maximum amount of pages in a worksheet</b>	199
<b>Amount of elements in an exercise or question</b>	Minimum 1 Maximum 26 (or less)
<b>First problem number</b>	Between 1 and 1999
<b>First page number</b>	Between 1 and 1999
<b>Positions of the problems answers</b>	4 positions: - No answers - Answers after each problem - Answers together at the end - Answers in a separate page
<b>Positions of the page number</b>	11 positions *: - No page numbering (1) - Up, down (2) - Left, center, right, inside, outside (5) (* $1 + 2 \times 5 = 11$ )
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