

Making Items in Möbius part A

**Copyright © Metha Kamminga
Januari 2023**

Making Items in Möbius part A

Contents

1 Möbius Making test items part A	1
1.1 Information and downloads	1
1.2 Introduction	1
1.3 Quality requirements for test items	2
1.4 Hints for using Möbius Content Repository	3
1.4.1 All Content Types	4
1.4.2 Lessons & Assignments	6
1.4.3 File manager	7
1.4.4 Course modules	7
1.4.4.1 Exporting items or groups	8
1.4.4.2 Exporting an extended Course Module	9
1.5 Structure of a Question	10
1.5.1 Create new question	11
1.5.2 Question Text	12
1.5.3 Question type of the answer field	12
1.5.4 Finishing the question	15
1.5.5 Overview of the Question	16
1.5.6 Edit Details	18
1.6 Tables and colors in the presentation of the Question	20
1.7 Numbers, characters, links and fonts in the Question presentation	23
1.7.1 Numbers	23
1.7.2 Euro, dollarsign and pounds	25
1.7.3 html codes for characters and Greek characters	25
1.7.4 html codes for layout	27
1.7.4.1 Post a link	27
1.8 Figures in the Question	28
1.8.1 Upload pictures and other files	28
1.8.2 Important hints for pictures	30
1.8.3 Pictures in the item	31
1.8.4 Uploading pictures	34
1.8.5 Pop-up window	35
1.8.6 iframe for a movie	37
1.9 Different question types	38
1.9.1 Multiple Choice Response Area	39
1.9.1.1 Randomizing Multiple Choice questions	43
1.9.2 Numeric Response Area	44
1.9.2.1 Numeric with units	48
1.9.2.2 Randomisation	50
1.9.3 Essay Response Area	51
1.9.3.1 Grading of the Essay question type	53
1.9.4 List Response Area	54
1.9.4.1 Drop-down Menu	54
1.9.4.2 Textfield	55
1.9.4.3 Regular expression match	59
1.9.4.4 Extra possibilities with Regular expression match	61
1.9.5 Clickable Image Response Area	69
1.9.5.1 Randomizing of the Clickable Image	71
1.9.6 Matching Response Area	72
1.9.7 Sorting Response Area	73
1.9.8 Maple-graded Response Area	75
1.9.9 Mathematical formula Response Area	75

1.9.10 Free Body Diagram Response Area	75
1.9.11 Sketch Response Area	75
1.9.12 Math App Response Area	75
1.10 Adaptive Question Designer	75
1.10.1 General	76
1.10.2 Complex question followed by sub-questions design phase	79
1.10.3 Complex question followed by sub-questions in a test	80
1.10.4 Grading sub-questions separately	81
1.10.5 Partial grading	82

List of Figures

Figure 1.1: Content Repository	4
Figure 1.2: Creating New Question or New Group	4
Figure 1.3: Menu to select and organize items and groups	6
Figure 1.4: Lessons&Assignments	6
Figure 1.5: Menu to select and organize units	7
Figure 1.6: Acces to the file manager	7
Figure 1.7: To organize files in folders in the File Manager	7
Figure 1.8: Exporting items	8
Figure 1.9: Creating a course module	9
Figure 1.10: Making a Course Module	10
Figure 1.11: Create a new question	11
Figure 1.12: The different sections in the question	11
Figure 1.13: Question Text	12
Figure 1.14: Insert an answer field (Response Area)	13
Figure 1.15: Multiple Choice Response Area	13
Figure 1.16: To determine the correct answer of the Multiple Choice	14
Figure 1.17: Edit an answer field	15
Figure 1.18: Finishing the Question	15
Figure 1.19: Preview during creating	16
Figure 1.20: The overview of the Question	17
Figure 1.21: Cloning a Question	18
Figure 1.22: Overview of the Question by Details	19
Figure 1.23: More Details of the Question	20
Figure 1.24: Insert a table	21
Figure 1.25: Image next to the text	21
Figure 1.26: Adjust properties of a cell of a table	22
Figure 1.27: The Source button for lay-out	23
Figure 1.28: In theAlgorithm you can define variables, for example numbers	24
Figure 1.29: Select Special Character	25
Figure 1.30: Special characters with html-code or Equation Editor	26
Figure 1.31: Table with special characters	26
Figure 1.32: Post a link	27
Figure 1.33: Class File Manager	28
Figure 1.34: Class File Manager	29
Figure 1.35: View this file with url visible	30
Figure 1.36: Pictures in the Question Text or in the alternativer of the Multiple Choice answer field	31
Figure 1.37: Button to insert images	31
Figure 1.38: Edit images in the text of the Question or in alternatives multiple choice answer field	32
Figure 1.39: Image in the alternative of Multiple choice answer field	33
Figure 1.40: uploading images and organize them in the folders	33
Figure 1.41: Settings of the images	34
Figure 1.42: Text to read in a pop-up window	35
Figure 1.43: Making a pop-up window	36
Figure 1.44: Settings for the pop-up window	36
Figure 1.45: Insert a movie	37
Figure 1.46: A movie in an iframe in text or feedback	37
Figure 1.47: Example of a composite Question with more answer fields	38
Figure 1.48: Insert a Response Area	39
Figure 1.49: Multiple Choice with response specific feedback	40

Figure 1.50: Multiple Choice Response Area	40
Figure 1.51: To opt for the correct answer and formulate response specific feedback	41
Figure 1.52: Multiple Choice Response Area	42
Figure 1.53: Randomisation Multiple Choice	43
Figure 1.54: Algorithmic variable for the correct answer of the Multiple Choice question.....	44
Figure 1.55: Numerieke Response Areas	45
Figure 1.56: Algorithm of the Question	45
Figure 1.57: Question Text	46
Figure 1.58: Dialog box of the Numeric answer field	46
Figure 1.59: Information about the settings of number	48
Figure 1.60: Information about the settings of unit	49
Figure 1.61: Enter units in the design of the Numeric question	50
Figure 1.62: Essay question type	52
Figure 1.63: Essay question type	53
Figure 1.64: Gradebook with option To Be Reviewed	53
Figure 1.65: Question type List	54
Figure 1.66: Edit Response Area of the answer field List	55
Figure 1.67: List Response Area with blank	56
Figure 1.68: To edit the Response Area of type List with blank	56
Figure 1.69: Length of the answer fields	57
Figure 1.70: Length of the blanks equal	58
Figure 1.71: Extended text fields	58
Figure 1.72: Editing extended text fields	59
Figure 1.73: Regular expression match example 1	60
Figure 1.74: Regular expression match example 2	61
Figure 1.75: Regular expression match example 3	61
Figure 1.76: Regular expression match example 4a	62
Figure 1.77: Regular expression match example 4	63
Figure 1.78: Regular expression match example 5	63
Figure 1.79: Regular expression match example 6	64
Figure 1.80: Regular epression match example 7	65
Figure 1.81: Regular expression match example 8a	66
Figure 1.82: Regular expression match example 8	67
Figure 1.83: Regular expression match example 9	68
Figure 1.84: Regular Expression match example 10	68
Figure 1.85: Question type Clickable Imagemap	69
Figure 1.86: Creating the clickable image answer field	70
Figure 1.87: Defining areas in the image	70
Figure 1.88: Edit Source	71
Figure 1.89: Source code of the Question	71
Figure 1.90: Matching	72
Figure 1.91: Inserting Matching question type	72
Figure 1.92: Feedback of the Matching question type	73
Figure 1.93: Sorting question type	74
Figure 1.94: Inserting an answer field question type sorting	74
Figure 1.95: Changing lay out of the sorting answer field	75
Figure 1.96: Adaptive question start	76
Figure 1.97: Creating the adaptive question	76
Figure 1.98: Settings for one Adaptive Section	77
Figure 1.99: Student sees the buttons of an adeptive question	77
Figure 1.100: Student sees the buttons of an adeptive question after one attempt	77
Figure 1.101: The student sees the result of the adaptive question after grading	78
Figure 1.102: The student gives up the attempts by clicking on the Next Part button	79
Figure 1.103: Two sections	79

Figure 1.104: Grading of the adaptive question with grade calculation	81
Figure 1.105: Two adaptive sections	81
Figure 1.106: Grading of the question as a whole	82
Figure 1.107: Full grade if all correct otherwise partial grading	82
Figure 1.108: Calculation of the grading if not all correct	83

1 Möbius Making test items part A

Especially for users who have nothing to do with formulas.

Update febr. 2022

© Metha Kamminga

1.1 Information and downloads

- **Home page Metha Kamminga**
More information about courses and news about Möbius on the site of Metha Kamminga:
<https://www.methakamminga.nl>.
- This manual is part of a series:
- Möbius Making test items part A (without formulas)
- Möbius Making test items part B (with formulas) <https://www.methakamminga.nl/MapleTA/ItemsMobiusDeelBeng.pdf>
- Möbius Making test items part C (special features)
- Randomization

1.2 Introduction

- *Möbius is often used for training*
The system is ideal for individual training, but also offers possibilities for online testing of large groups, protected with password and the like and even with a *Browser Lock*, so that during the test, the student cannot access any application and cannot consult Internet sources.
In this training, hints and feedback can be made accessible, so that making tests can have a learning effect. The feedback may contain references to the course material.
It is also possible to resit an *Assignment* (test) more times or to make settings for adaptive applications by means of the settings (*Properties*).
In principle, each Question can be expanded adaptively with many possibilities for didactic applications.
See also articles about digital testing on the homepage of Metha Kamminga:
<https://www.methakamminga.nl/MapleTA/>
- *Formative testing*
For formative testing, take practice tests of approximately 15 minutes that the student goes through in a certain order. Short tests for which you give 10 points and on which the student must score at least 80% provide quick feedback and insight into their own abilities. Larger tests usually do not pick up students in the formative situation.
- *Make great use of the possibility of regrading in the beginning*
The system is inexorable in the assessment. Give students the opportunity to communicate about their work. Do a regrading from the *Gradebook* where you look in the *Details* at the type of mistakes the students make. If necessary, initially give an extra point for a half-correct answer to stimulate and write comments on it when regrading.
- *Communication*
Good communication with your students is conducive to the quality of your database if you update the Questions after a course, provide feedback, and extract the imperfections.
- *Make taking practice tests mandatory*
It turns out that making the training mandatory pays off. Students sometimes think they know they can do it, but for developing speed and routine, the training is absolutely necessary. Also with a view to introducing formulas, the development of some experience of the student is

necessary. It appears from experience that all students who had done training and had scored above 80% on all practice tests, possibly after resit, had passed the (written) final test! The many ways to randomize make it possible to put together many different equivalent tests.

- *Decimal numbers*
If decimal numbers are used, ALWAYS use a decimal point (also in the *Question Text*). See section *Numeric Response Area* (page 44) for testing with numbers.
- *Browser*
For the back office, preferably use FireFox as a browser. Students can also use these but also Chrome. Preferably no Windows Internet Explorer.
Also don't use an automatic translator of the page. It will destroy things.
- *Copy and paste*
NEVER copy and paste content from Word to Möbius. You then involuntarily take code with you that often cannot be translated by the browser.

1.3 Quality requirements for test items

Reading from the screen is seven times more difficult than reading from paper

studies have shown.....

You can promote the user-friendliness that the student experiences by making high-quality test items.

With a test, it is important that the student can read the question well before giving the answer. Here are some hints to increase the readability on the screen and improve the quality of the test item.

- The latest **browsers** support the option to adjust the font size with the mouse wheel and the [Ctrl] button pressed. Make the students aware of this.
When creating the test item you should take this into account. So make sure that you offer the information clearly. If necessary, use tables.
- If you enter a Question into the system with **copy and paste**, in general never do so from Word, but from, for example, NotePad or WordPad that is formatting-free. The system automatically uses a font that is easy to read on the screen. The program offers enough possibilities to make the layout of the question clear and attractive.
- To **emphasize** something you can use color and italics and bold. However, never use underline to emphasize anything. If you use the red color, take bold immediately, otherwise it will be worse to read on the screen.
- In the CSS of the Question you can opt for a **special style** of your Questions.
- Make sure that in the text the **sentences are not too long**.
Go to a new line regularly, which makes the information about the question clear.
In case the text of the question is long, create a table around the text so that the lines do not occupy the full width of the screen. Maintain the width of the table at approximately 600 to 800 pixels.
Always start with the information and end with the final question.
Be sure to go to a new line when the final question is asked and maybe it's even better to ask the question after a white line.
- Present **images** (pictures and formulas) in the text with space around it.
- Make sure that any **picture** in which something needs to be read are also clear and **large enough** on the screen.
Always give information about the picture (preferably next to it by means of a table without border) and make sure that the student has to scroll as little as possible to read something in the picture and to give an answer in the answer field.

- Also make sure that the **pictures are scaled in advance** with a maximum size of 700 pixels. Generally 400 pixels wide. The images can be scaled in the *Question Text*, but that does not benefit the quality. In addition, loading a picture that is too large takes too long when starting up an assignment.
- When using **graphs**, make sure that the line thickness may be taken a little more strongly than standard.
When using colors in graphs, make sure you have different line styles at the same time (so as not to disadvantage color blind people).
- For more information see section *Images in the test item* (page 28).
- **Use tables** (with or without borders) to provide the information clearly.
- Make sure that **variables are italic** in the text, which greatly increases readability. Possibly working with LaTeX for the variables is also very beneficial for readability. (See manual part B.)
- In Möbius, always work with **decimal point** to avoid confusion, even if there is no calculation and also in the *Question Text*.
Möbius certainly cannot handle decimal comma. Commas are meant for other things.
- Give good **hints** (which can possibly be turned off on certain tests), because often the Questions are used as teaching material to learn from. It is possible to set points deduction after opening hints by the student. For more than one hint, you can pin the order.
- Also pay attention to the **feedback**. Often the feedback and giving hints depends on the teacher and the target group for which the Questions are used.
So be careful in adding hints and feedback with a view to reusing the *Question Banks*. (*Hints* and *Feedback* can optionally be turned off in the settings of the test.)
- Separate **feedback for each answer field** gives feedback in the *How-Did-I-Do* situation. There is a separate tab for designing this of each answer field.
- If you work in a team, it's good to think about **metadating**. Even if you use a test die, it is useful to apply metadating using the *Information Fields* of each Question. Furthermore, there are many possibilities for metadating in Möbius.
- Do **analysis of your tests** to see if there are any questions where the text might not be clear, or if it is important to add more feedback or hints. In the *Gradebook* of Möbius there are many possibilities for test analysis.
- **Randomization** is a powerful feature of Möbius.
In order to **reuse Question Banks** and duplicate Questions with the aim of modifying them, it is important that you make good use of the *Algorithm* section. Changing something about it is very easy and you have quickly created a new Question.
- Sometimes it is not so clear to see how some complicated things are programmed in the *Algorithm* section. Therefore, give **transparent names to the variables**.
In order to make the Questions usable for others, some comments in the form of instructions in the *Algorithm* section are sometimes recommended.
HINT: Then create a line of text in the *Algorithm* :-text; containing the instructions.
- Give **good instructions** in the *Question Text* **how the answer should be typed in** by the student.
An example is indicating the number of decimal places or not decimals but fractions, only the number, the whole equation or just the right hand side, whether there should be commas in between or brackets around it or the brackets worked out etc. etc..

1.4 Hints for using Möbius Content Repository

- There is a good **help function** that can be reached via Help at the top right of the screen.

Möbius Help for instructors <https://digitaled.com/support/help/instructor/Content/Instructors-Home.htm>

- When **logging out**, use *Logout* at the top right, where you can also adjust your profile by clicking on your name.
However, if you walk away, your login will automatically die out after a while (about 30 minutes) for security reasons. Therefore, make sure that you never walk away halfway through the creation of an item without saving, because then you will lose your work over time.

The *Content Repository* basically consists of two parts:

- 1 All Content Types
- 2 Lessons & Assignments

More information about these two things in the following sections.

1.4.1 All Content Types

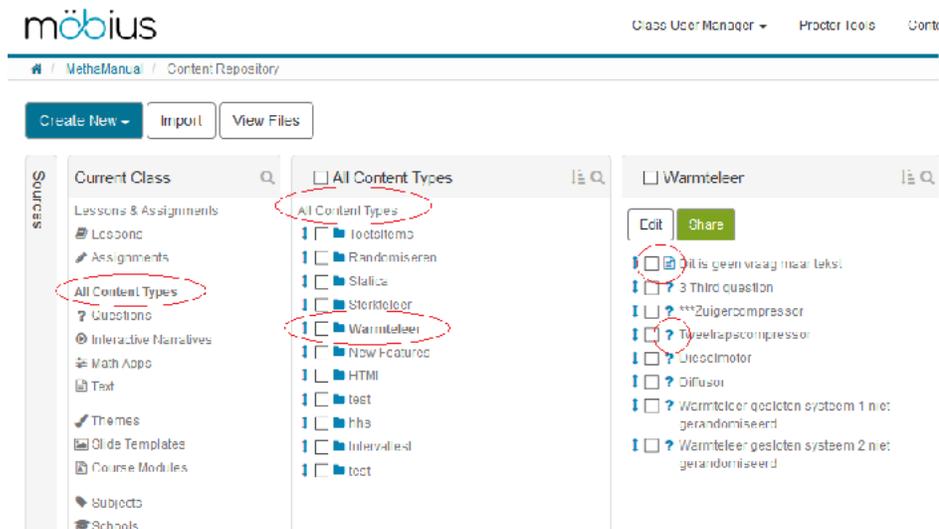


Figure 1.1: Content Repository

All *Content Types* are divided into *Groups*.

Content Types are pieces of Text, Questions, Interactive Narratives or Math Apps with which you can build up Lessons and Assignments.

Always prepare this content before creating Assignments and Lessons.

In the right column of the figure you see Questions and Text items in the *Group* "Warmteeler".

The figure below shows how to make a new *Group* or to make a new item (Question/Text, Interactive Narrative or MathApp) within a group.

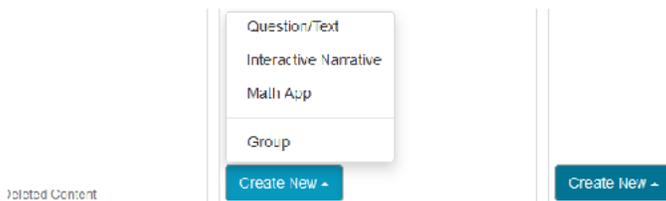


Figure 1.2: Creating New Question or New Group

Below are some hints about the Content Repository

- With the anchor in front of the checkbox of a *Group*, the *Group* can be dragged from top to bottom to the desired order.
- Never randomly press the green *Share* button if you have selected a *Group* or *Questions*. This green button then ensures that you make the *Group* or *Questions* in the Cloud available to everyone.
- In the *Current Class* in *All Content Types* you will find two major kind of items: *Questions* and *Text*.
In fact, these are items of the same kind. If you create a Question without an answer field (*Response Area*), the system will see it as Text. You can create a piece of teaching material in this way. As soon as there is at least one answer field in a Question, the system sees this as a real Question and a question mark appears in the list in front of the item.
- In *All Content Types* you see the structure of the folders (*Groups*) with Questions and Text items. And if you click on *Questions*, you will only see the Questions and not the text items. So you can filter the content by type.
- You will also see *Interactive Narratives* at *All Content Types*, which are pieces of teaching material offered as slide sheets. This manual is not about this kind of content.
- And also *Math Apps* that are made in the computer algebra system Maple with interactive things such as scroll bars and buttons. The student can view this in any browser platform-independent. This manual is not about this kind of content.
- It is definitely advisable to organize your Questions, pieces of theory, and Math Apps in *Groups* with possibly subgroups.
Advice is not to leave any loose items below the *Groups*.
- What is special is that you can **organize items into more than one Group!** There are no copies of this item in the different groups. It remains the same item organized in more than one *Group*.
- If a **test item has been modified**, this has consequences for the student who is presented with this item in an *Assignment*. In principle, the student will always see the latest version of a test item that has been processed in an *Assignment* from the *Content Repository*.
However, if the settings of the test are set to *Reuse previously generated algorithmic variables*, then the student gets the original version of his test with wiped-in fields and therefore also the original version of the modified test item.
Previously created *Assignments* are therefore made with the old version of the test item and access via the *Gradebook* will therefore always show the version of the test item at the time of taking the test. The stored records of the students remain accessible to students and instructors unchanged. Items from the *Content Repository* can therefore be modified and reorganized in *Groups* at any time, even if students are busy with tests.
- There is a **version control** of the test items. Previous versions can be retrieved! However, the name of the item always remains the last name given. The metadating will also continue to work in all versions according to the last given metadating (*Information Fields*).
HINT: Also pay attention to the number of versions of an item in the version manager. If there are a lot of them so that opening this item in an assignment becomes slow. Then you better start cloning this item and throwing away the old one. (A Question or item can only be thrown out if it is not included in an assignment.)
- As soon as you put a check mark in one or more of the items, a menu appears at the bottom with which you can add the item (*Add to*) to another *Group* or with move (*Move to*) from one *Group* to another, or export and save (*Export*) or make a copy (*Clone*) or remove from the *Group* (*Remove*) or discard (*Delete*).

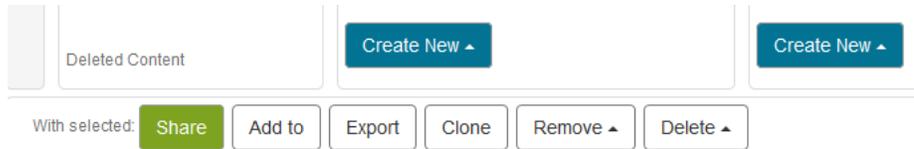


Figure 1.3: Menu to select and organize items and groups

1.4.2 Lessons & Assignments

Another part of the *Content Repository* is the section with *Lessons & Assignments*. This section has a division into *Units*.

HINT: Each *Lesson* or *Assignment* can only be organized into only one *Unit*.

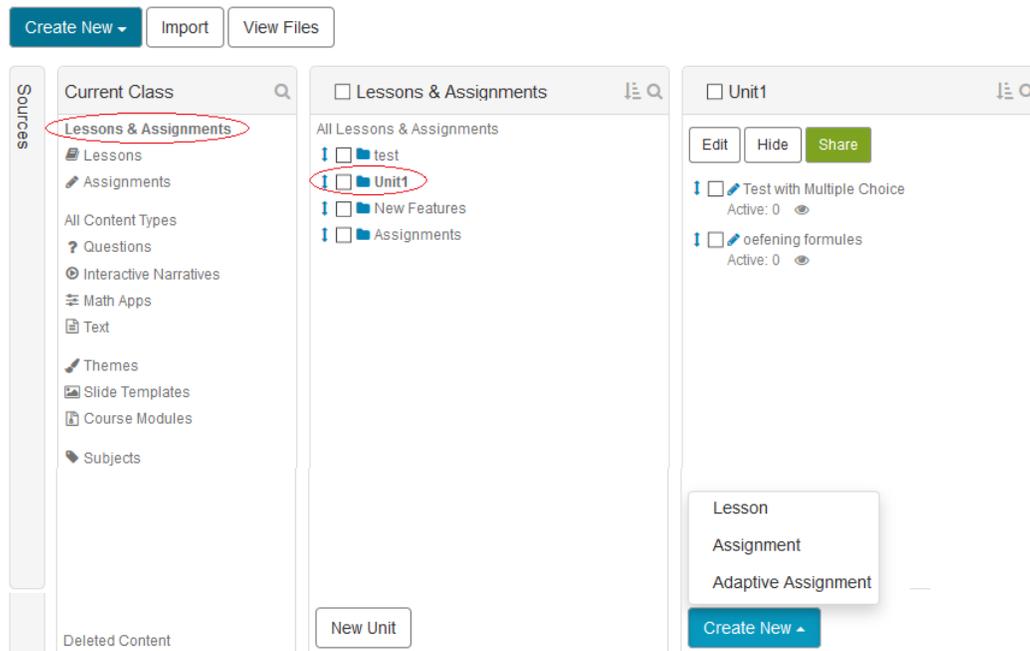


Figure 1.4: Lessons&Assignments

- If you click on *Lessons & Assignments*, you will see the lessons and tests, organized into *Units*. Lessons are literally lessons with text, Questions, videos Math Apps and the like alternated. These Lessons can also be graded by the system and appear in the *Gradebook*. Assignments are tests on which students can achieve a score. The results are also in the *Gradebook*.
- Never randomly press the green *Share* button if you have clicked on a *Unit*, *Assignment* or *Lesson*. This green button then ensures that you make this part of content in the Cloud available to everyone in the world.
- You can create a new *Unit* with the *New Unit* button.
- If you are in a *Unit*, you can use the *Create New* button to create a new *Lesson* or *Assignment*.
- The *Units* correspond to the structure of the lessons and tests offered to the student on the homepage.
- As soon as you put a check mark in one or more of this components, a menu appears at the bottom with which you can move the item (*Move to*), or export and save (*Export*) or make a copy (*Clone*) or remove from the *Unit* (*Remove*) or discard (*Delete*).

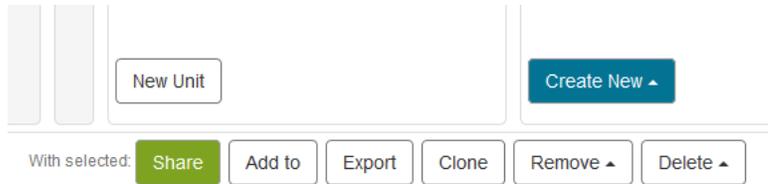


Figure 1.5: Menu to select and organize units

1.4.3 File manager

The *File Manager*, where you store all your pictures and other documents to use in Questions and other items, is available via *Content Repository*.

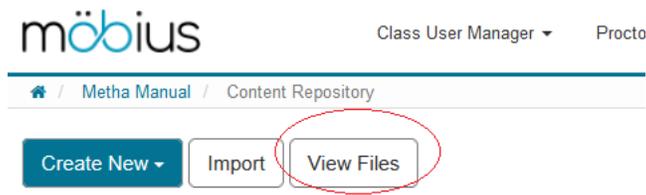


Figure 1.6: Access to the file manager

A few hints for the files in the File Manager

- It is useful if you make a **division in folders** for your Class of the pictures that belong, for example, to different topics. The best thing is if you keep the folder structure of the pictures more or less in line with the group structure of your items.
- Also make sure that the pictures have the **desired size before** you upload them (about 500×500 or smaller) so that scaling in the text of the item is no longer necessary and loading the pictures while opening a test takes not too long.
- Also make sure that the names of the pictures contain **absolutely no spaces and diacritics** (accents and the like) and are not too long. The same goes for the **folder names!**
- Once pictures are entered in the *Class File Manager*, the **structure is fixed**. You are dealing with **Static Resources** here. So you cannot change the structure without this having consequences. The Question always refers to the (fixed) position of the picture in the *File Manager*.
- Click on the icons (see figure below) in the *File Manager* to *Create new subfolder*, *Upload files to this point* or *Delete this folder*.

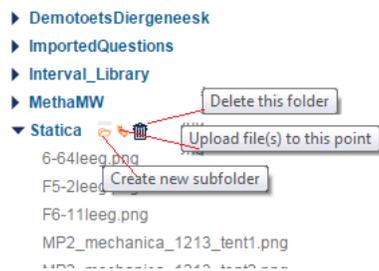


Figure 1.7: To organize files in folders in the File Manager

For more information about images in items (Questions etc.) , see section (page 28)

1.4.4 Course modules

Exporting content is done via a *Course Module*.

A *Course Module* is a package of content what belongs together. It will be packed in a zip file, ready to export and import. Don't unzip this zip file!

There are several ways to export content:

- Exporting a single item (like a *Question*) or some more items.
- Exporting a Group (from the *All Content Types*), you can simply check the checkbox in front of a *Group* (or you select several *Groups*) and press on the *Export* button.
- Exporting an extended *Course Module* with *Lessons and/or Assignments and Groups* and folders (with pictures) etcetera all together.

1.4.4.1 Exporting items or groups

You can check one or more items and click *Export*.

The screenshot shows the Möbius Content Repository interface. At the top, there are navigation links for 'Class User Manager', 'Proctor Tools', and 'Content Repository'. Below this, there are buttons for 'Create New', 'Import', and 'View Files'. The main content area is divided into three vertical tabs: 'Sources', 'Current Class', and 'All Content Types'. Under 'All Content Types', there are two panels: 'ToetsitemsA' and 'List item'. The 'List item' panel shows a list of items with checkboxes. Two items, '08 written numerals' and '09 taal leestekens', are selected. A modal dialog box titled 'Coursemodule.zip openen' is open, showing the file 'Coursemodule.zip' (1.9 KB) and the option 'Bestand opslaan' (Save file) selected. The 'Export' button at the bottom of the interface is also highlighted with a red circle. Red arrows indicate the flow from the selected items to the modal dialog and then to the 'Export' button.

Figure 1.8: Exporting items

Check a few items of your choice and some buttons will appear at the bottom. You choose *Export*, which will bring up a pop-up to save the file (as a zip file = a course module).

Save it to your hard drive.

In another *Class* you can load this content again via the *Import* button of the *Content Repository*. Don't forget to organize these imported items into *Groups* in your folder structure there.

HINT: If the items contain pictures, then the folder (in the *File Manager*) in which the picture is included with only the relevant picture, is automatically also imported. That is why you always organize your pictures in the *File Manager* in folders.

HINT: Exporting **one or more Groups** goes exactly in the same way as exporting single items. Even better: importing *Groups* will keep the structure of the *Groups* together.

IMPORTANT HINT: It is not recommended to export *Lessons, Assignments or Units with Lessons and Assignments* separately. Lessons and Assignments are built up with elements from the section *All Content Types*.

If you export *Lessons and Assignments* separately and save it as a zip file, **the structure of your content will be lost when you will import this zip file** somewhere else. The *Questions* are then all cluttered and piled loose in the question bank without structure in *Groups* and the *Lessons or Assignments* will be put in the *Default Unit* automatically.

1.4.4.2 Exporting an extended Course Module

The **advantage of exporting and importing a Course Module** is that you **keep the structure of the organization** of your content like *Assignments, Lessons* (in *Units*) and item banks (in *Groups*) including the folders of the pictures in the *File Manager* together as well as *Themes and Policy Sets* and *Slide Templates*.

Cross-references always go well that way.

Bundle your content in the following way by first creating an (empty) *Course Module*.

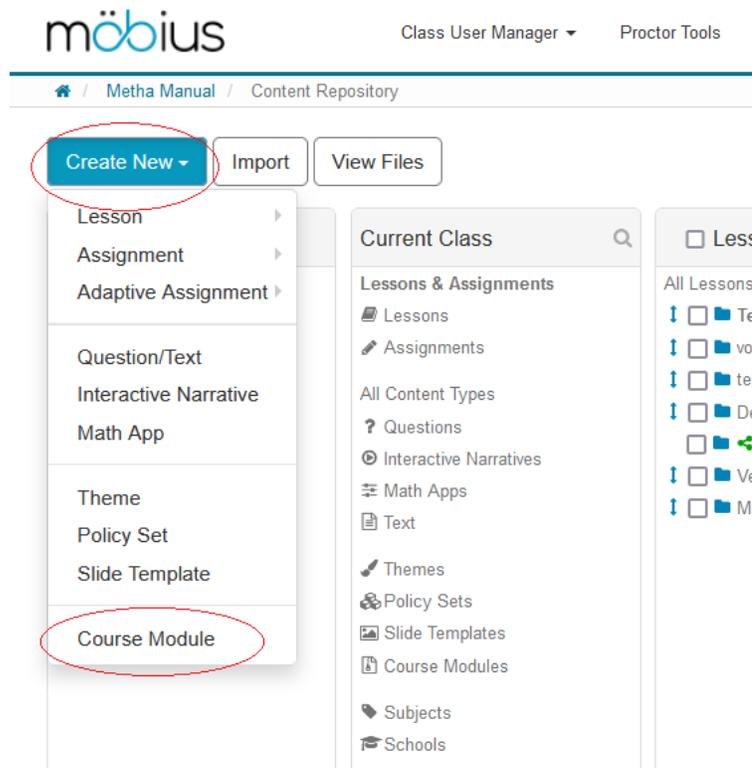


Figure 1.9: Creating a course module

In the figure above you see how to create an (empty) *Course Module*. And give it a name.

You will then fill the *Course Module* with *Assignments/Lessons and Groups* of content items. To fill the *Course Module*, choose in your *Content Repository* some *Lessons* and *Assignments* or **even better** a *Unit* (or more *Units*) as a whole by checking the checkboxes (to keep the structure of your *Units*).

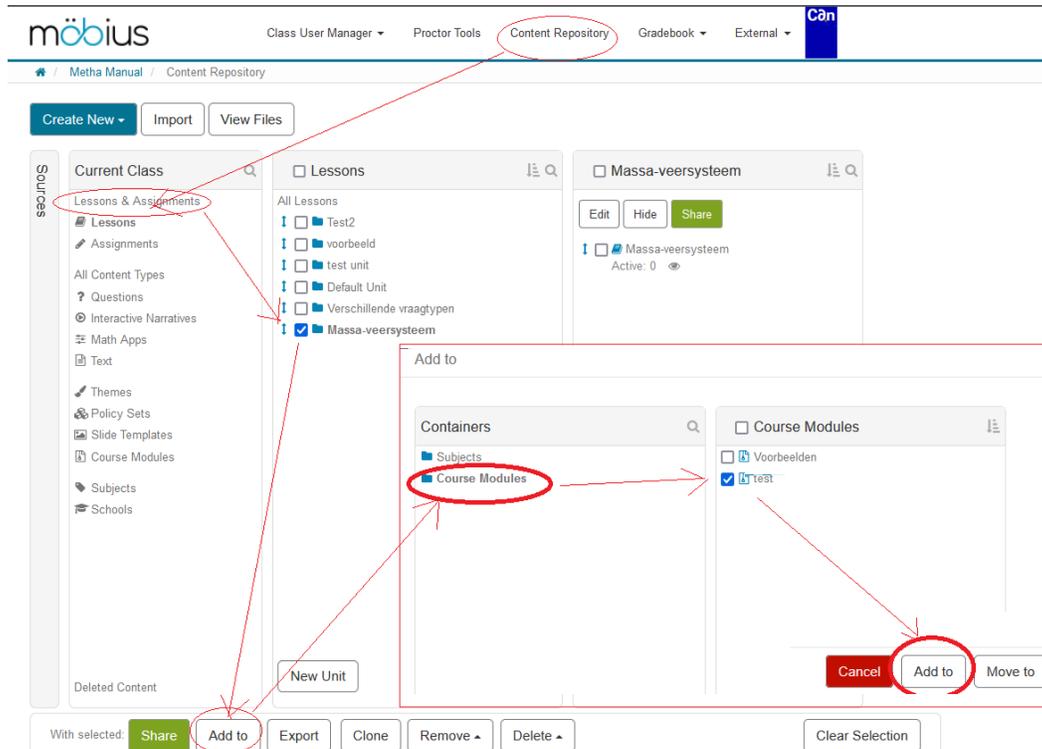


Figure 1.10: Making a Course Module

In the figure above you see how to add a *Unit* (including *Assignments and Lessons*) to a *Course Module*.

With the button *Add to* choose and click on *Course Modules* and make a choice in which of the prepared *Course Modules* you want to put this content.

Finally press on the *Add to* button (*Move to* will not work).

Next you will add some corresponding *Groups* to this very *Course Module* as well in order to keep everything together.

To add the *Groups* belonging to the *Lessons and Assignments* check the checkboxes of these *Groups* and do the same procedure as to add *Units* to the *Course Module*.

HINT: The **huge advantage** of the export of *Units* with corresponding *Groups* bundled in a *Course Module* is that it keeps underlying structure all together importing this *Course Module* in another *Class*.

WARNING: If you want to remove a part of a *Course Module* from the *Course Module*, tick this part and click on *Remove* (so definitely not on *Delete*).

With *Delete* you also remove the part from the original *Content Repository*, for which you will be warned.

1.5 Structure of a Question

Based on one Question, we will look at what the structure of a Question looks like in general. Click in a *Group* the button *Create New* and opt for *Question/Text*.

1.5.1 Create new question

Click in a *Group* the button *Create New* and opt for *Question/Text*.

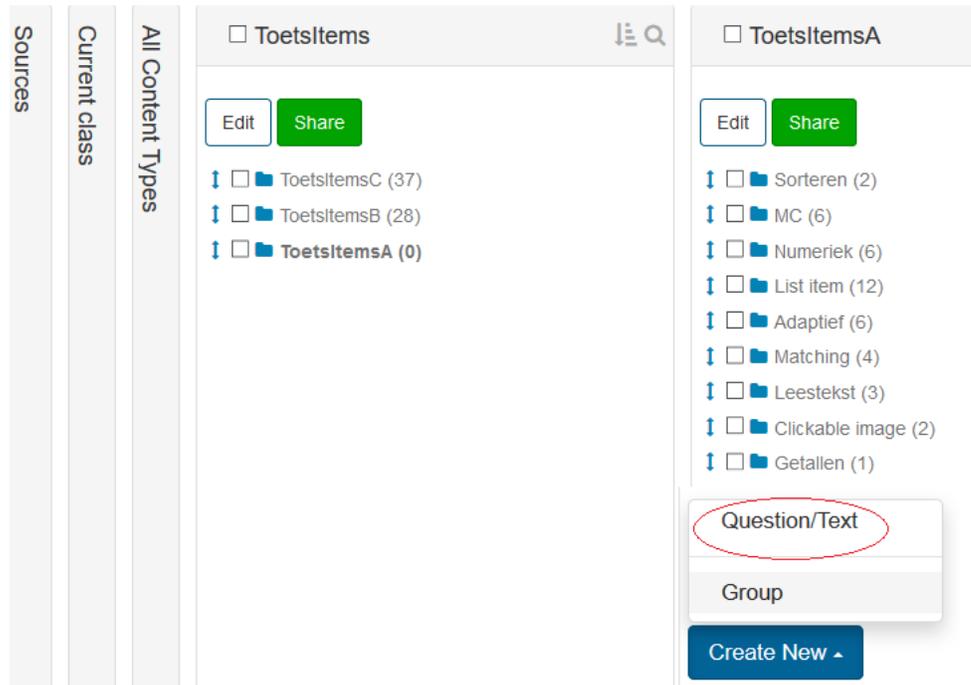


Figure 1.11: Create a new question

The screenshot shows the 'Question Designer' interface. At the top, there is a breadcrumb trail: 'MethaManual / Question Designer'. Below this is a table with six rows, each representing a section of the question. The first row is 'Question Name' with a text input field containing 'Naam van de vraag'. The other five rows are 'Question Text', 'Author Notes', 'Algorithm', 'Custom CSS', and 'Feedback', each with a plus sign and a text input field.

Figure 1.12: The different sections in the question

Start by filling in the name of the Question. The student does not see this name.

- You can change the name of a Question when editing this item. The name of a Question is not visible to the student in an Assignment. The name only serves as a reminder to the instructor of the Class's *Content Repository*. In the version control, you will only see the last name of the Question.
HINT: Do not use diacritics such as tremas and accents in the names of the items. Not even with the names of the Assignments and the names of the Groups.
- In the search function of the *Content Repository*, in addition to words in the *Question Text*, you can also search for words in the names of the Questions. You can also put the Questions in order

of name in the *Content Repository*, so that you can probably take into account the enforcement of the order, for example by numbering the Questions.

In the section *Question Text* comes the text of the Question with embedded the answer fields (*Response Area*).

In the section *Author Notes* the author of the Question can make some notes. The student will not see this.

The section *Algorithm* is the heart of the Question. Here you create the algorithmic variables that can be called everywhere in the whole Question.

In the section *Custom CSS* is to program something that has to do with the layout of the Question. Here you can opt for one of the default style sheets.

[Help for themes in style sheets](#)

(<https://digitaled.com/support/help/instructor/Content/INST-CONTENT-REPO/Themes.htm?Highlight=theme>)

In the *Feedback* you can put the information for the student to tell how it should have been done.

1.5.2 Question Text

Open the section *Question Text*.

In this section you have a lot of layout options with the buttons. You can now formulate the question and you can define an answer field (*Response Area*) using the button with the check mark.



Figure 1.13: Question Text

The figure shows how a *Response Area* is inserted where the cursor is located somewhere in the text.

A few hints about the section Question Text:

- NEVER use copy and paste from Word. Rather open the Word file in NotePad or WordPad (formatting-free) and everything goes smoothly. Microsoft Word is very Internet-unfriendly!
- A handy button is the third button from the left in the top bar. This maximizes the screen to organize your Question clearly. To return to other buttons, click this button again.
- **Do not use the Browser's Back button to go to a previous screen.** Because you work on-line, it may be that the page then "expires". (But it's worth trying.) Rather use the navigation buttons of the system, but note that changes are not always saved if you have not explicitly clicked OK or something like that.
- It is not possible to open another browser in Möbius with the same login. As soon as you switch to the other browser, you will be thrown out at the first one.
HINT: Do you often use copy and paste from other items, login with a second account and not with the same.

1.5.3 Question type of the answer field

You now insert a *Response Area* with the button with the check mark. A dialog box will open in which you have to choose a certain question type.

For this answer field, you first choose the question type *Multiple Choice* (bottom left)

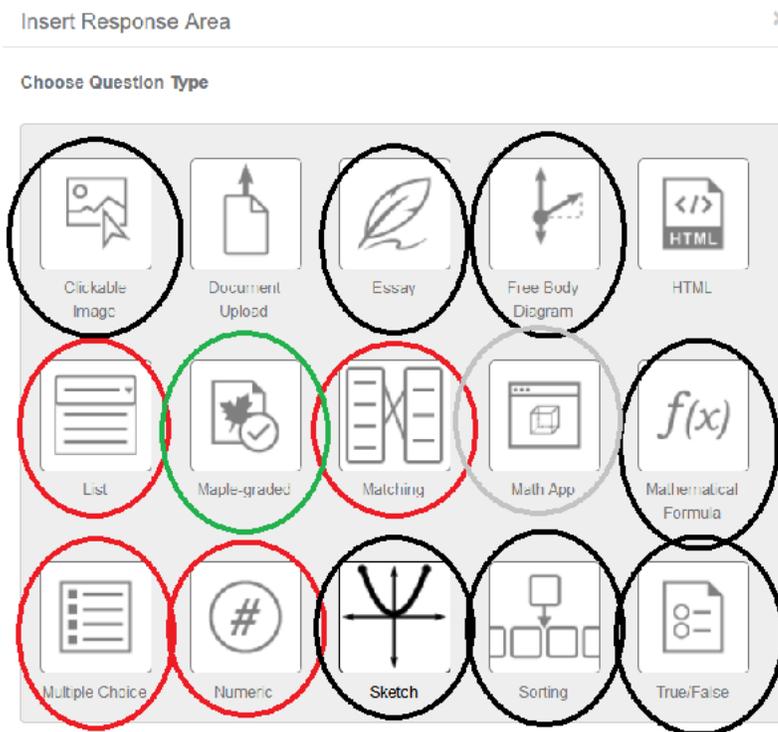


Figure 1.14: Insert an answer field (Response Area)

The moment you insert an answer field of question type *Multiple Choice*, there will be a matching dialogue screen that is exactly right for a multiple choice question.

The image shows a configuration dialog for a "Multiple Choice" question. At the top, there is a "←" button and the title "Insert Response Area". Below this are two tabs: "Question" (selected) and "Feedback". The main heading is "Multiple Choice :".

Settings include:

- Weighting:** A text input field containing the number "1".
- Selection:** Radio buttons for "Single" (selected) and "Multiple".
- Shuffle Choices:** Radio buttons for "Yes" and "No" (selected).
- Display:** Radio buttons for "Vertical" (selected) and "Horizontal".
- Choices:** Two empty text input fields. Each field has a rich text editor toolbar above it with icons for Source, Undo, Redo, Copy, Paste, Bold, Italic, Underline, Subscript, and Superscript. To the right of each field is a red "Delete" button.

Figure 1.15: Multiple Choice Response Area

In the above figure *Figure 1.15 (page 13)* by default you will see the weight (*Weighting*) = 1 filled in.

You can also set a different weight for this answer field. For example, if you want to create even more answer fields within this Question (using the check mark), then the number of points that are assigned to this Question within a test is divided proportionally to the value of the *Weighting* among the answer fields.

At the top of the dialog box, you'll see an additional tab with *Feedback*. If you fill in something here, the student will see that in the *How did I do* situation of an Assignment or Lesson. The feedback you enter here does not come in the *Feedback of the Question* after grading of the Assignment.

Multiple Choice question settings:

- *Selection*: with *Single* is set that only one answer can be correct. If you opt for *Multiple*, then the radio buttons of the alternatives will automatically turn into checkboxes and more alternatives can be correct.
- *Shuffle Choices* choose between *Yes* and *No* if you want to offer the alternatives of the *Multiple Choice* answer field in the Assignment or not in varying order, respectively.
- *Display* choose between offering the alternatives vertically below each other or horizontally next to each other.
- *Choices* you fill in the different alternatives where there are some possibilities for the layout.
- With the button *Add Choices* allows you to add as many alternatives as you need.
- You now click on the OK button to get to the rest of the *Multiple Choice* dialog box. After all, no statement has yet been made about the correct answer.
(Note that the OK button is sometimes off-screen! Use your mouse wheel to make this button visible.)
- With the *Sigma* button for the layout you can still formulate special characters or formulas in the alternatives.

Images in the alternatives are also possible, see section *Figures in the Question (page 28)*

Now click OK to confirm this first before you enter the next screen to determine which one should be the correct answer.

Edit Response Area

Please select the correct value(s).

(1) 100 m fixed

(2) 110 m fixed

(3) 120 m fixed

(4) Geen van bovenstaande antwoorden is goed fixed

You can also use an algorithmic value as the correct answer

Correct answer:

Use Response Specific Feedback

(1)

(2)

(3)

(4)

OK Cancel

Figure 1.16: To determine the correct answer of the Multiple Choice

In this screen you determine which is the correct answer. Because you have chosen *Shuffle Choices Yes* to offer the alternatives in different order, checkboxes will still appear behind each alternative to possibly fix one or more, in this case the fourth alternative is eligible to fix.

For response specific feedback, look further into the explanation of this question type *Multiple Choice Response Area* (page 39).

Now first click on the blue OK button to get back into the field of the *Question Text*.

The screenshot shows a user interface for editing a question. On the left, there are two sections: 'Question Name' and 'Question Text'. The 'Question Name' field contains the text '00 test hoe hoog is de toren'. The 'Question Text' field contains the text 'Hoe hoog is de toren?' followed by four radio button options: '100', '110', '120', and 'Geen van de t'. A red oval highlights the text 'Double-click the response area to edit' at the end of the 'Geen van de t' option.

Figure 1.17: Edit an answer field

If you want to change something in this answer field, double-click on the location of the answer field to get back into the dialog box of this answer field.

It is possible to create even more answer fields within this Question, but if you are first satisfied with one answer field, you could now close the Question. Later, you can optionally open and edit the Question again.

HINT: The item is marked as a Question if at least one answer field has been created.

If you have not created any answer field in your text, the system will not see this item as a Question but as Text.

1.5.4 Finishing the question

Once you've finished the *Question Text*, you may want to preview before closing. You then look at the question as the student also sees it. You do not have to fill in all categories of the item. We first leave the *Algorithm* and *Feedback* section for what they are.

For more information about *Algorithm* see section *Numbers* (page 23).

At the bottom of the screen, you'll see four buttons.

The screenshot shows four buttons at the bottom of the screen: 'Save & Close' (blue), 'Save' (light blue), 'Preview' (light blue), and 'Cancel' (red).

Figure 1.18: Finishing the Question

If you click on the blue *Save & Close* button, the Question is saved and you are out of the editor of the Question.

You can also click the second *Save* button to save the Question while working on it.

IMPORTANT HINT: Be aware that each time you do that (click on *Save* or *Save & Close*) you will create a new version of the Question in the version control (*Revisions*). Keep in mind that too much of these revisions will make the system slow.

With *Preview* you can test the Question in the meantime without closing the question. You will then get a pop-up as in the figure below.



The screenshot shows the Möbius logo at the top left. Below it is a horizontal line, followed by the word "Preview" in a bold, sans-serif font. Underneath "Preview" is the question text: "Hoe hoog is de Oldehove?". Below the question are five radio button options: "100 m", "30 m", "150 m", "75 m", and "300 m". At the bottom of the options is a text-based option: "Geen van bovenstaande hoogtes is goed". Below the question and options is a horizontal bar containing four buttons: "Grade" (blue), "How Did I Do?" (white with grey border), "Refresh" (white with grey border), and "Close" (red).

Figure 1.19: Preview during creating

In the *Preview*, try out the Question with *How did I do* and with *Grade* to see if the grading goes well.

With the red button *Close*, nothing is saved and you go out of the Question.

1.5.5 Overview of the Question

After you have clicked on the blue *Save & Close* button, the Question is also immediately saved. You will then be taken to the overview of the Question of where some things still need to be done.

The screenshot shows the 'Question Overview' page for a question titled 'Hoe hoog is de toren?'. At the top right, there are 'Share' and 'Edit' buttons. The main content area displays the question text 'Hoe hoog is de Oldehove?' and a list of radio button options: 300 m, 100 m, 75 m, 30 m, 180 m, and 'Geen van bovenstaande'. A large magnifying glass icon is overlaid on the question text. Below the question, there are several sections: 'Details' with an 'Edit Details' button, 'Authors' listing 'Metha Kamminga' and 'CANdiensten', 'Groups' with an 'MC' button, 'Statistics' showing 'No statistics are currently available for this question', 'Hints' with an 'Add' button and a link to 'click here to add one', and 'Revisions' showing two entries from 'Tue Dec 17 2019' with 'View', 'Clone', and 'Make Current' buttons.

Figure 1.20: The overview of the Question

In the overview of the Question you will see a number of important things.

- At the top is the **name of the Question** (which the student does not see).
- Next to it, you'll see a green *Share* button. This is for making the Question available to others via the cloud. Deal with this consciously.
- In addition, you will see the *Edit* button that brings you into the editor of the Question where you can adjust everything. Closing the editor again provides an additional version of the Question in the version control (*Revisions* at the bottom).
- You will see the Question and clicking on it will put you in the preview of the Question.
- Below that, you'll see an important button: *Edit Details*. (See section below for more information.)
- *Authors*: which authors worked on the Question is shown here. When you create a new Question, your name will be listed with the Question, indicating the server you're working on.

If someone else then edits the Question, his or her name will also be included (above it).
If you clone a Question via the *Clone* button at Revisions, you are in fact creating a new Question and the revision management of the original Question in the new Question is no longer visible and neither are the authors.

- In *Groups* you can see where the Question is organized in the group structure of your database. (You can organize the same Question into more *Groups*.)
- Furthermore, you can see roughly how this Question was scored in *Statistics*.
- You can add *Hints* to the Question here. You stick it to it from the outside, as it were. With the hints you can also award a penalty for deduction of points if the student opens the hint. More hints at the Question are possible.
- Finally, you will see the *Revisions*. Every time you open the Question to edit with the *Edit* button at the top right of this overview, and then you exit again, a new version of the Question appears in the database. Even when clicking on *Save* in the meantime of creating the Question, a new version of the Question will be added. You can always go back to a previous version of the Question with *Make Current*. Be aware that the *Hints* and the name of the Question will not be restored.
HINT: If there are very many versions of a Question because you have always revised the Question, it may be that the system becomes slow because every time all versions are loaded again.
HINT: in case of excessive amounts of revisions, consider cloning the Question and throwing away the old version.
- From this overview of the Question, it is also possible to clone the Question with the *Clone* button. This will give you a copy that can be treated as a new Question.

HINT: when cloning a Question, a copy is made with the same name and extension -Clone.
Advice: press on the name of this cloned Question (and not on the blue button *Done*). You will view the cloned Question where you immediately will go to *Details* to rename the Question and fill in the *Group* where you want to organize this Question.



Figure 1.21: Cloning a Question

1.5.6 Edit Details

Now click on the *Details* button in the overview of the Question (*Figure 1.20 (page 17)*)

Figure 1.22 shows the 'Edit Details' dialog box for a question. The dialog is titled 'Edit Details' and contains the following fields and options:

- Name:** A text input field containing 'Hoe hoog is de toren?'.
- Description:** A large empty text area.
- Attribution:** A dropdown menu showing 'CANdiensten'. Below it is a checkbox labeled 'Attribute myself' which is checked.
- Difficulty:** A dropdown menu showing 'Medium'.
- Language:** A dropdown menu showing 'Undefined'.
- Subjects:** A list of checkboxes with the following labels: 'Built Environment' (checked), 'Oscillations', 'Finance', 'Chemistry', 'Physics', and 'Biology'.

At the bottom right of the dialog are two buttons: 'Cancel' (red) and 'Save' (blue).

Figure 1.22: Overview of the Question by Details

- The name of the Question can be quickly adjusted here without editing the Question itself. In this way, there will also be no revision in the version control of the Question. However, if you go back to an older version of the Question, this new name will be retained.
- The *Difficulty* of the Question can be adjusted for the purpose of filtering (think of the test die)
- The *Language* of the Question can be adjusted for the purpose of making the Question available in the cloud.
- The setting of *Subjects* is also for the purpose of finding the Question in the cloud.

If you go further, you will see even more categories in the *Details*.

Attribute myself

Difficulty: Medium

Language: Undefined

Subjects:

- Built Environment
- Oscillations
- Finance
- Chemistry
- Physics
- Biology
- Statistics
- Engineering
- Mathematics

Groups:

- ToetsitemsA
- MC

Information Fields

Add Row

Field	Value

Cancel Save

Figure 1.23: More Details of the Question

- With *Groups* you can organize the Question in one or more groups. If you have created a new Question, do so immediately after you have closed the Question, so you can easily find it later.
HINT: You can organize an item into more groups.
- With *Information Fields* it is possible to assign metadata to the Question. For example, Field = level and Value = 4. This is for the purpose of filtering the Questions. Think of the test die.
HINT: The *Information Fields* once added to a Question do not change or disappear if you go back to a previous version of the Question.

1.6 Tables and colors in the presentation of the Question

Not only in the text field of the Question, but also in the layout of, for example, the feedback, the layout can be taken care of, so that the presentation is optimal. See also in section *Quality requirements for test items* (page 2)

HINT: If not all buttons for the layout work properly (for colors or font), it may be due to the browser you are using. For editing items, the Firefox browser is the most recommended.

- The *Maximize* button (third button from the top left) is for maximizing the field. You can then use the entire screen to create the Question! (Do switch back with this button before you finish the Question and to get to the other buttons.)
- You can insert a table using the appropriate button (see figure below).

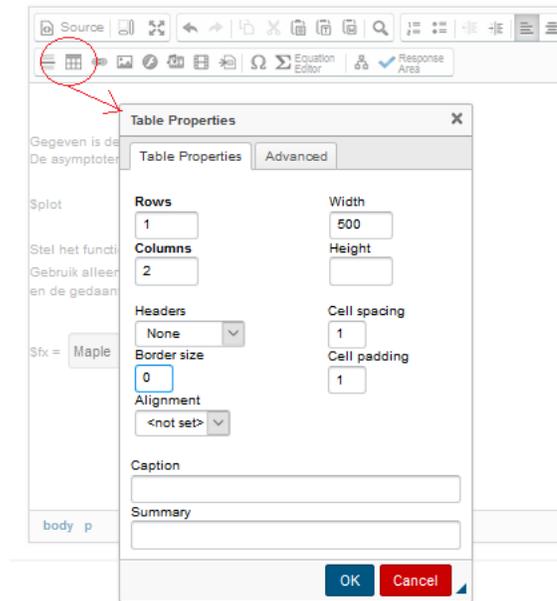


Figure 1.24: Insert a table

It is often useful to present the data in a table and work with colors. Or you can use a table to present an image next to the text.

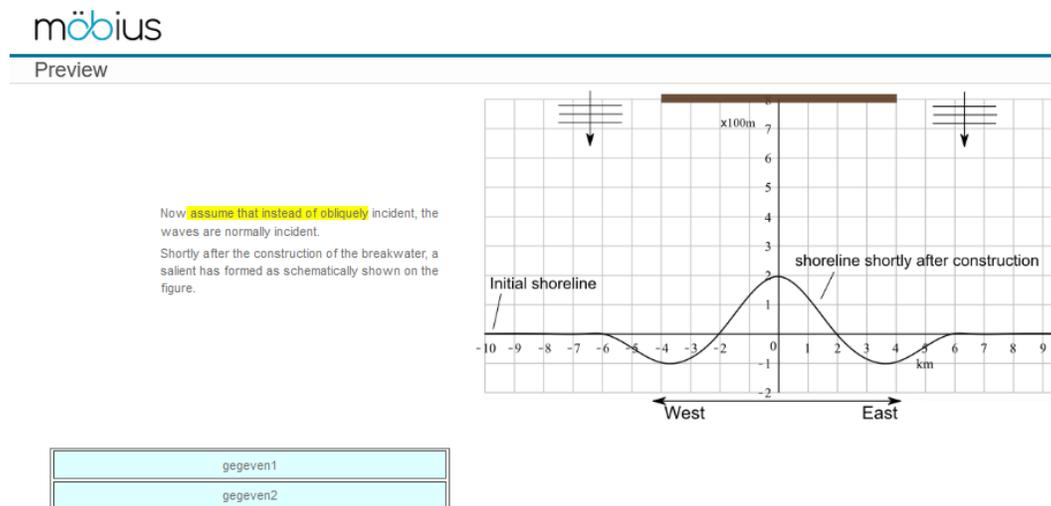


Figure 1.25: Image next to the text

There are buttons to color the text with *Text Color* and in addition there is a button for background color with which pieces of text can be provided with a background color (highlighting).

HINT: Right-click in a cell of the table, you get to the properties of the cell and then color it or something like that, or you can go to the *Table Properties* or add rows or columns.

HINT: In the source code (*Source* button) you can do an additional setting for the width of the table with `width:800px;max-width:800px;`

HINT: There is also a button for the font and font size and styles for headers (custom CSS of the Question to adjust or opt for a *Theme*).

HINT: In principle, you use the default font for the text, but to emphasize things, you can work with the font button. So never copy text from Word and paste it into Möbius. A lot of polluting Word code goes unnoticed under water. Word is not suitable for the web. Also for the size of the letter you generally use default. After all, the student can zoom in with the [Ctrl] key and the mouse wheel to get everything bigger on the screen.

HINT: If you want to have more extensive possibilities to format a table or otherwise influence the layout, you can work with the html code and customize it: clicking on the *Source* button in the *Question Text* can do a little more with the help of html tags.

HINT: A **trick** to have the **default font in the table** is to do Enter after typing the content of a cell. Then you remove the Enter again. The effect is that you have more space round the text in the cell and the same font like the rest of the text. In the source code now you see `<p>` tags round the text of the cell.

Figure 1.24 (page 21):

```
<table border="1" width="35%">
<tbody>
<tr>
<td bgcolor="#DDFFFF" style="text-align: center;" valign="middle">
<p>gegeven1</p>
</td>
</tr>
<tr>
<td bgcolor="#DDFFFF" style="text-align: center;" valign="middle">
<p>gegeven2</p>
</td>
</tr>
</tbody>
</table>
```

The html tags stand for the following:

`<tr>` means table row.

`<td>` means table data.

With the right mouse button you can adjust several things about the table:

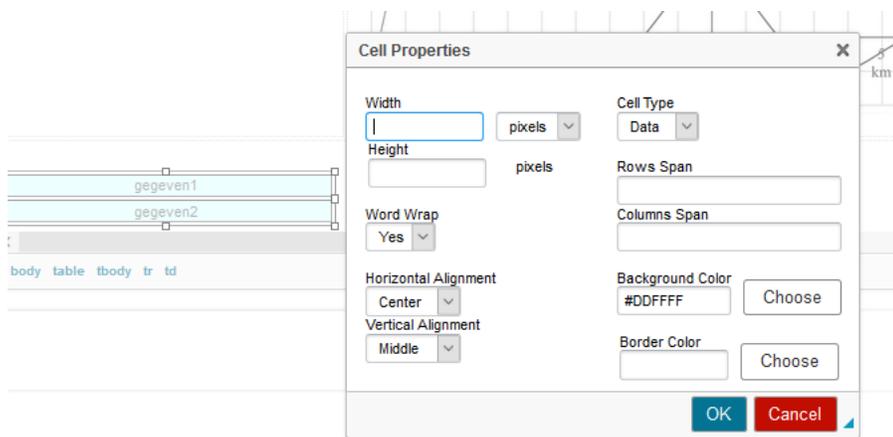


Figure 1.26: Adjust properties of a cell of a table

1.7 Numbers, characters, links and fonts in the Question presentation

Usually you use the buttons that are offered with the text of the Question or with the text in the feedback and the like.

These layout buttons are not always available. Consider alternatives to *Questionanswer* fields with limited layout buttons and in a few other situations it may be useful if you know some html codes. It is also useful if you know the way to the *Source* button, as shown in the figure below.

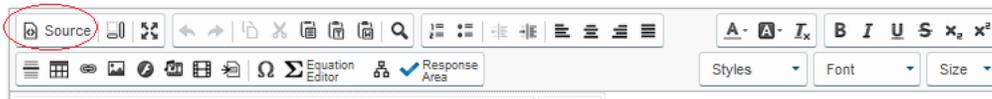


Figure 1.27: The Source button for lay-out

HINT: If you use the buttons in this toolbar to adjust the layout, you can later look in the *Source* code to see what the translation to html code is. You can then use this code (copy and paste) for other situations where you do not have access to an extensive button bar for the layout.

1.7.1 Numbers

Möbius presents large numbers generated in the *Algorithm* section, always with a comma as thousands separator. This comma is not always desirable. The system ALWAYS uses a decimal point for calculations. Students could be misled if you mix decimal point and comma.

If you don't want to see a thousand separator, there are tricks to show the large numbers generated during calculations in the presentation of the Question, without the decimal point on the screen. In the *Algorithm* section of the Question, create a variable with the number written in Maple or using MathML code.

Example

This example lifts a tip of the veil when it comes to randomization.

In the *Algorithm* section you create variables that you can call throughout the Question with its name $\$...$, see also section about *Numbers* Figure 1.28 (page 24).

```
$a=range(1000,5000);
```

Don't forget to end with a semicolon.

This variable $\$a$ will show a comma in the final Question when used in the text. This comma then acts as a thousands separator (although it can be used for calculations).

If necessary, create a new variable in the *Algorithm* that can also be used in calculations.

```
$A="$a"; or
```

```
$AA=maple("$a");
```

Optionally, you can also encode the number with MathML

```
$Adisplay1=mathml("$a");
```

or with the following:

```
$Adisplay2=maple("printf(MathML[ExportPresentation]($a)");
```

```
$Adisplay3="\(x+$a+56\)";
```

The latter is made using LaTeX code (recognizable by the tags $\backslash(\dots)$) and then the thousands separator is not included either.

The ways with MathML are also nice, because the number is then presented a little more strongly in the Question, but can of course not be used in calculations. The LaTeX code cannot be used in calculations either.

Then use \$A or one of the other variables in the *Question Text* or in the *Hints* or in the *Feedback* of the Question and so on so that there are no more unintended commas.

The figure below shows the effect of the different ways of programming numbers in the section *Algorithm*.

```

1 :-De eerste drie kunnen ook bij berekeningen gebruikt worden;
2 $a=range(1000,5000);
3 $A="$a";
4 $AA=maple("$a");
5 :-de volgende drie zijn niet geschikt voor berekeningen;
6 $Adisplay1=mathml("$a");
7 $Adisplay2=maple("printf(MathML[ExportPresentation]($a)");
8 $Adisplay3="\(x+$a+56\)");

```

Variable	Value
a	1,768
A	1768
AA	1768
Adisplay1	1768
Adisplay2	1768
Adisplay3	$x + 1768 + 56$

Figure 1.28: In the *Algorithm* you can define variables, for example numbers

- Enforce a certain way of noting decimals with the Möbius command `numfmt` (numeric according format):
`numfmt ("#.00 " , 20.9) ;` gives the result 20.90.
`numfmt ("#0.000 " , 3/4) ;` gives the result 0.750.
- You can also enable Maple to do the rounding:
`maple("Float(round(100*20.9) , -2) ") ;` gives the result 20.90.
`maple("Float(round(1000*3/4) , -3) ") ;` gives the result 0.750.
- The system itself can also round in the following way:
`$test5=decimal(2,20.90123) ;` gives 20.9.
`$test6=decimal(2,20.9123) ;` gives 20.91.
 NOTE: This way of rounding does not always give the desired result.
 There is another alternative for better rounding with the following command:
`$test7=decimal(3,5*1.7^4) ;`
 gives the **wrong rounding**: 41.76 of the number: 41.7605
`$test8=maple("MapleTA:-Builtin:-decimal(3,5*1.7^4) ") ;`
 gives the **correct rounding** 41.761 of the number 41.7605.

HINT: The figure also shows how to program interline comments with `:-` and close with `;`. This is also preceded by a `#` instead of `:-`.

HINT: An ability to present thousands in the *Question* with a space is the following:

In the *Algorithm* section, create a variable as follows:

```
$duizend=range(3,300);
```

Don't forget to end with a semicolon.

Keep in mind the number of thousands in the calculations!

A space can then be entered in the layout of the Question: \$thousand 000.

For example, the final question will be: 45 000.

Even better is a half space with LaTeX:

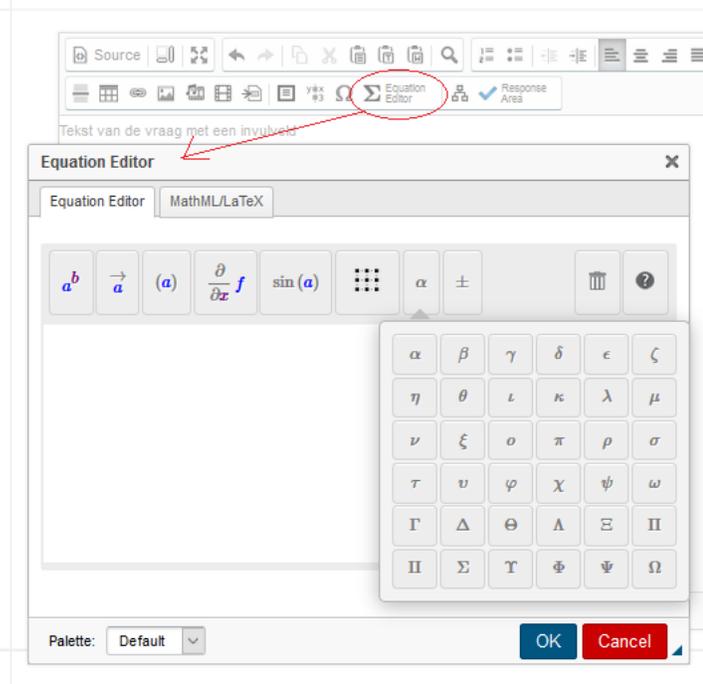


Figure 1.30: Special characters with html-code or Equation Editor

The formula is then not built with html code, but is based on MathML code.

Extensive information about Formulas you will find in the *Möbius Making test items part B*.

HINT: Also take a look at the [site for html codes](https://text-symbols.com/html/) (https://text-symbols.com/html/) for more characters.

HINT: Also look in the manual *Möbius Making test items part B* for formulas with LaTeX.

Characters in the text that can be made with html code (in the *Source*) follow below, possibly also with the key combination.

[Alt] is on the left and [Alt Gr] is the [Alt] button on the right of the keyboard.

$\times = \×$	[Alt Gr] [=]	$\perp = \⊥$	$m^2 = m\²$
$^\circ = \°$	[Alt Gr] [Shift] [:]	$\rightarrow = \→$	$m^2 = m\^{2\}$
$\pm = \±$	[Alt] [+0177]	$\leftarrow = \←$	$a_1 = \<i>a\</i>_{1\}$
$\frac{1}{2} = \½$	[Alt Gr] [7]	$\uparrow = \↑$	$\ddot{a} = \ä$
$\frac{1}{4} = \¼$	[Alt Gr] [6]	$\downarrow = \↓$	$\ddot{e} = \ë$
$\copyright = \©$	[Alt Gr] [C]	$\cdot = \·$	$\ddot{i} = \ï$
$\emptyset = \∅$	[Alt Gr] [Shift] [L]	$\bullet = \•$	$\geq = \≥$
$\tilde{n} = \ñ$	[Alt Gr] [N]	$- = \–$	$\leq = \≤$
$\csc = \ç$	[Alt Gr] [,]	$\grave{c} = \¿$	$\dots = \…$
$\text{\AA} = \å$	[Alt Gr] [W]	$\div = \÷$	$\infty = \∞$
$\pounds = \£$	[Alt Gr] [Shift] [\$]	$\langle = \⟨ (voor intervallen)$	$\rangle = \⟩ (voor intervallen)$
$\infty = \∞$		$\%o = \‰$	

Figure 1.31: Table with special characters

1.7.4 html codes for layout

`<i>` italic `</i>` voor cursief (italic)
`` emphasize`` heeft hetzelfde effect van cursief (emphasize) als italic
`` bold`` vertaling van vet is bold.
`<u>` underline `</u>` vertaling van onderstreep is underline
`²` superscript
`₁` subscript
`
` new line
`<p align="center">.....</p>`
`<hr size="2" width="90%">` horizontal rule
`....` if the text are colored red, it is also a good idea to make it bold for better readability on the screen.
`<i>l</i>` Certain letters become more readable when Times New Roman is used for the font. Think of the character l for length.

1.7.4.1 Post a link

If you want to use a link to an external site, always use a new window (`target="_blank"`), so that when the external site is closed, the student returns to the test question. (Note that this is not possible with Assignments with Proctored Browser (Browser Lockdown) because the student is then not allowed to access the Internet or use other applications outside the test.) Usually you use the button in the editor for the link: *Figure 1.32 (page 27)*.

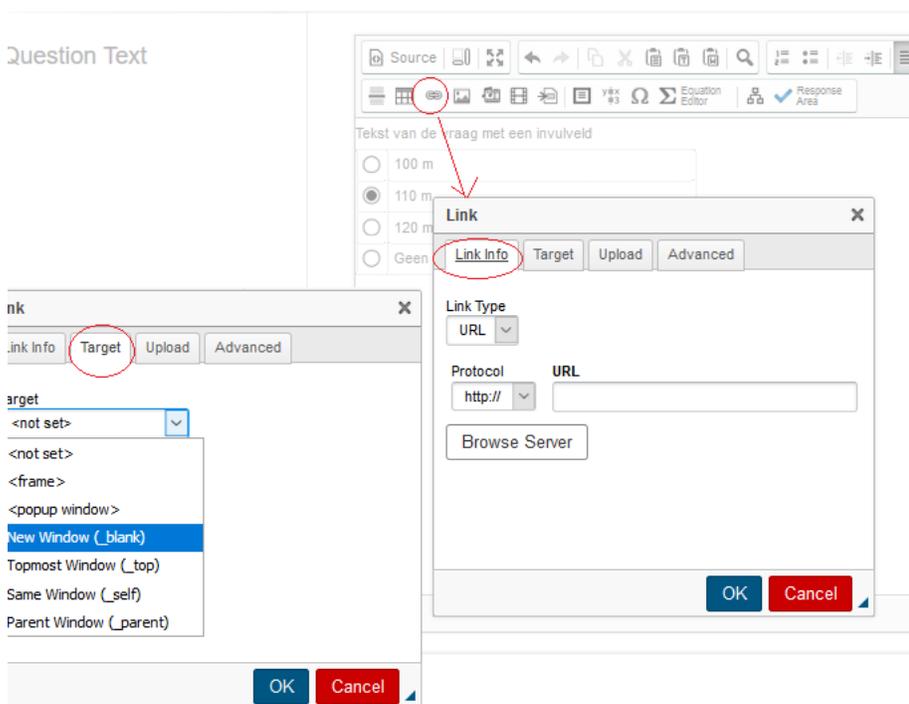


Figure 1.32: Post a link

This will take you to the Link-Dialog where you enter the address of the external site at URL. You can also use *Browse Server* to access your Class's *Class File Manager* to reference a file placed there.

Furthermore, you must also choose *New Window (_blank)* in the second tab (Target) of this Link dialog box, so that the link is opened in a new window and the student is back in the test when the window is closed.

HINT: After you have made the link, you can check the source code with Source to see what the translation is to html and then possibly use the code in situations where you do not have access to the buttons of the layout.

HINT: Look also in the section *Pop-up window* (page 35).

1.8 Figures in the Question

There are several options for communicating figures in an item.

You can also work with links *Post a link* (page 27) that allows you to refer to other places on the Internet.

You can place a figure in the text of the item, but also in the *Hints*, the alternatives of *Multiple Choice* answer field and even in the *Feedback* of a Question. These figures are stored in a separate container belonging to your Class where you also have the *Content Repository*. It's your Class's *File Manager* that you can access from the *Content Repository* by clicking *View Files*.

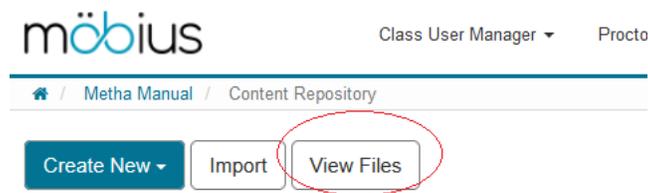


Figure 1.33: Class File Manager

The figures can be anything: pictures, situation sketches, photos and the like.

A few hints for the pictures:

- It is useful if you make a **division in folders** for your Class of the pictures that belong, for example, to different topics. The best thing is if you keep the folder structure of the pictures in line with the group structure of your items.
- Also make sure that the images have the **desired size before** you upload them (about 500×500 or smaller) so that scaling in the text of the item is no longer necessary and loading the images while opening a test takes not too long.
- Also make sure that the names of the pictures contain **absolutely no spaces and diacritics** (accents and the like) and are not too long. The same goes for the **folder names!**
- **HINT:** If you have a Word file with pictures, it is useful to save this Word file as an html file (web page).
You will then receive a whole folder in one go with pictures in gif format or jpg format or png format that are suitable for use in test items and are of the correct format. (Do not copy and paste the text from Word to Möbius because of the polluting codes that will then be carried. The Word program is not html-friendly.)
- Once pictures are entered in the *Class File Manager*, the **structure is fixed**. You are dealing with *Static Resources* here. So you cannot change the structure without this having consequences. In the text of the item you refer to the (fixed) position of the picture.

1.8.1 Upload pictures and other files

Pictures can be included in items, not only in the *Question Text*, but also in the alternatives of an answer field or in the *Feedback* or in the *Hints*. Pictures can play a role everywhere to illustrate things.

You can make a picture yourself or look it up on the Internet and save it in the *Class File Manager* of your Class, preferably a gif file, jpg file or a png file.

HINT: Nowadays you can also upload html files, PDF files, GGB files (Geogebra applets) and Excel files to the *Class File Manager* that you can reference from a query. If you use it, refer for example to an html page or PDF file by creating a link in a pop-up (see section *Pop-up window* (page 35)) or new window (target = _blank), as showed in section *Post a link* (page 27), so that when closing these pages one always returns to the item of Möbius.

Go to the *Class File Manager* in the *Content Repository*.

This *Class File Manager* contains a container with images for the content items.

HINT: If you are creating a *Group* with items that contain many pictures, create a corresponding folder in the *Class File Manager*. If you later want to move the whole thing, you can turn it into a *Course Module* that keeps the *Groups* together with the pictures in folders in its entirety and can be easily moved to other Classes.

Starting from the *Content Repository* click on *View Files*.

Click the triangle in front of the folder to see the folder contents.

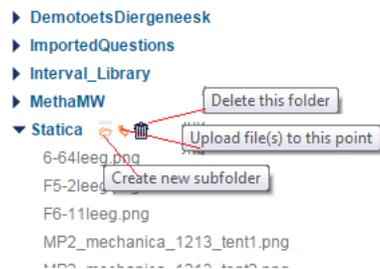


Figure 1.34: Class File Manager

HINTS:

- Make sure that the pop-ups on your computer are not blocked, otherwise click the mouse with the [Ctrl] button pressed.
- Once the images are in this container in folders, you can use them in the content items by reference.
Pictures are not physically placed in the items. The item only refers to a picture.
Opening a folder gives the names of all images contained in it and then click on *View this file*, you can see the image and also find out its url as you can see in the figure below.
- It is useful to upload the images required for one or more items first and to arrange them in appropriate folders, because once you have started working in the *Content Repository* you will already have the images available.
- You cannot change the name of the pictures once in this place. You can no longer rename the folders, nor can you change the layout. It's all static.
If you still want to change the name of a picture, first save it to your own computer, (click on *View this file* and right-click to save it) then throw it away with the bin icon and then re-upload the image under a different name.
- Click on the icon behind one of the pictures (*View this file*).

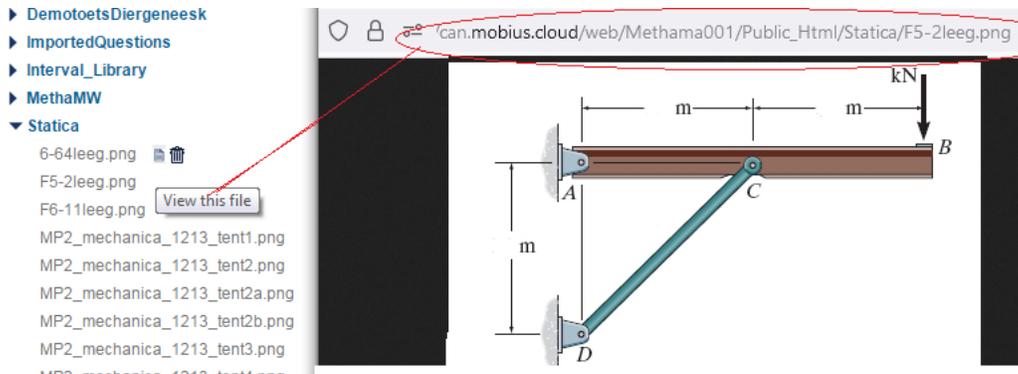


Figure 1.35: View this file with url visible

Optionally copy the url of this image to a NotePad file if needed for use in some items.

1.8.2 Important hints for pictures

- Never use more than 25 characters for the name of a picture and no spaces, or diacritics, otherwise it will no longer be possible to export folders with pictures using *Course Modules*. This also applies to folders.
- To be on the safe side, make sure that the names of the pictures in no way give information about the correct answer to the question.
- Furthermore, it is better to give the image the correct size in advance, because often images do not look better when they are resized. Indication of the sizes could be in the order of 400×400 pixels.
- As mentioned, pictures can in principle no longer be renamed later. What you can do is save the image, throw it away from the container and then upload it again under a different name.
- If you want to make changes in a picture: make the changes, throw the old picture away from the container and upload the changed picture (with the same name).
- **HINT:** It is easy to create pictures in PowerPoint. Save the image in PowerPoint as a .png file after all parts have been grouped. You then have an excellent picture to use in your items. Make sure that you first scale it to a handy format (for example with Paint) before you upload it to the system. Usually the images created in PowerPoint are too large. Now go back to the *Content Repository*.

1.8.3 Pictures in the item

In addition to pictures in the *Question Text*, pictures can also appear in the alternatives of the *Multiple Choice* answer field, as shown below:

The screenshot shows a question editor interface. At the top, there are buttons for 'Import' and 'View Files'. Below that, a vertical sidebar on the left contains 'Toetsitem', 'ToetsitemA', and 'MC'. The main content area is titled '04a MC met plaatjes constructieeler'. It contains the question text: 'Welke dwarskrachtenlijn hoort bij onderstaande constructie?' followed by a diagram of a beam with a uniformly distributed load and a fixed support. Below the question is the instruction 'Kies de juiste dwarskrachtenlijn hierbij.' and two radio button alternatives, each with a diagram of a shear force line. The first alternative shows a constant shear force, and the second shows a linearly decreasing shear force. At the top right of the question area, there are 'Share' and 'Edit' buttons, with 'Edit' circled in red. Below the question area, there are sections for 'Details' (with 'Edit Details' button) and 'Authors'. The 'Details' section shows 'Difficulty : Medium' and 'Language : Undefined'. The 'Authors' section lists 'Methainstructor Kamminga' and 'Maple TA server'.

Figure 1.36: Pictures in the Question Text or in the alternatives of the Multiple Choice answer field

If you open an existing test item, you can do so by clicking *Edit*.

The screenshot shows the question editor interface with the 'Image' button in the toolbar circled in red. The toolbar includes buttons for 'Source', 'Image', 'Equation Editor', and other editing tools. The question text and diagram are visible below the toolbar.

Figure 1.37: Button to insert images

In the *Question Text*, you can click (double click) the picture or click the *Image* button with the picture selected to edit the picture or if there was no picture yet, insert one.

This will take you to the *Image Properties*. *Figure 1.38* (page 32) .

By clicking the *Browse Server* button you can search for the image in the *Class File Manager* of your Class in the same folder structure, as you have created and filled it yourself. You may need to hold down the [Ctrl] key when clicking *Browse Server* in case popups are blocked.

HINT: *Browse Server* may not work properly with some Internet Explorer browsers. In that case, use a different browser (Fire Fox or Chrome) for these actions with images.

Furthermore, a few things can be adjusted, such as an *Alternative Text* that will be visible with mouse-over (Windows). In fact, this is not the text that normally appears with mouse-over.

In the source code (click on *Source*) you can change `alt=` with `title =` or add it, so that with mouse-over a text appears next to the image: ``.

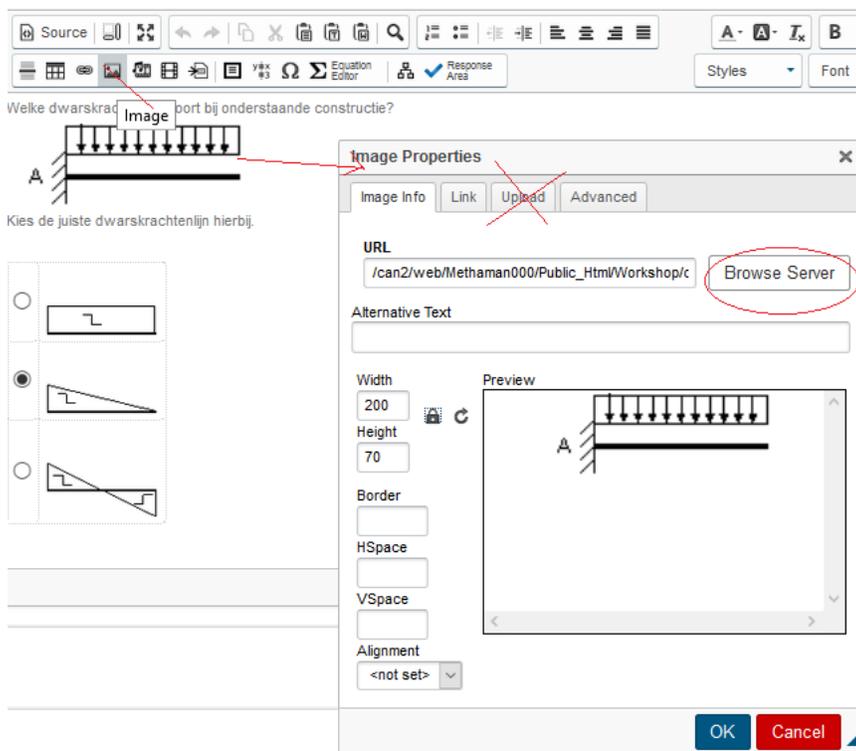


Figure 1.38: Edit images in the text of the Question or in alternatives multiple choice answer field

WARNING: Do not use the *Upload* tab in the *Image Properties* (you will not know where the image will end up and will be difficult to find later). To upload pictures, go to *Browse Server* and there you can upload pictures. Of course you could have uploaded the images in advance directly into the *File Manager*, but you can also do this via *Browse Server* during creating a Question or item

HINT: For pictures in the alternatives of a *Multiple Choice* answer field, proceed in the same way.

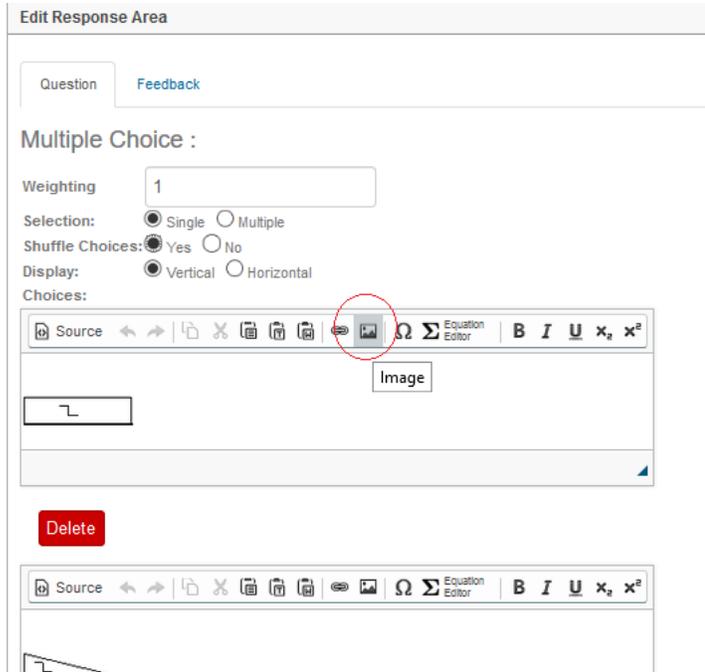


Figure 1.39: Image in the alternative of Multiple choice answer field

Click from the picture on *Browse Server* (starting from *Figure 1.38* (page 32) you will go to the following *Figure 1.40* (page 33)).

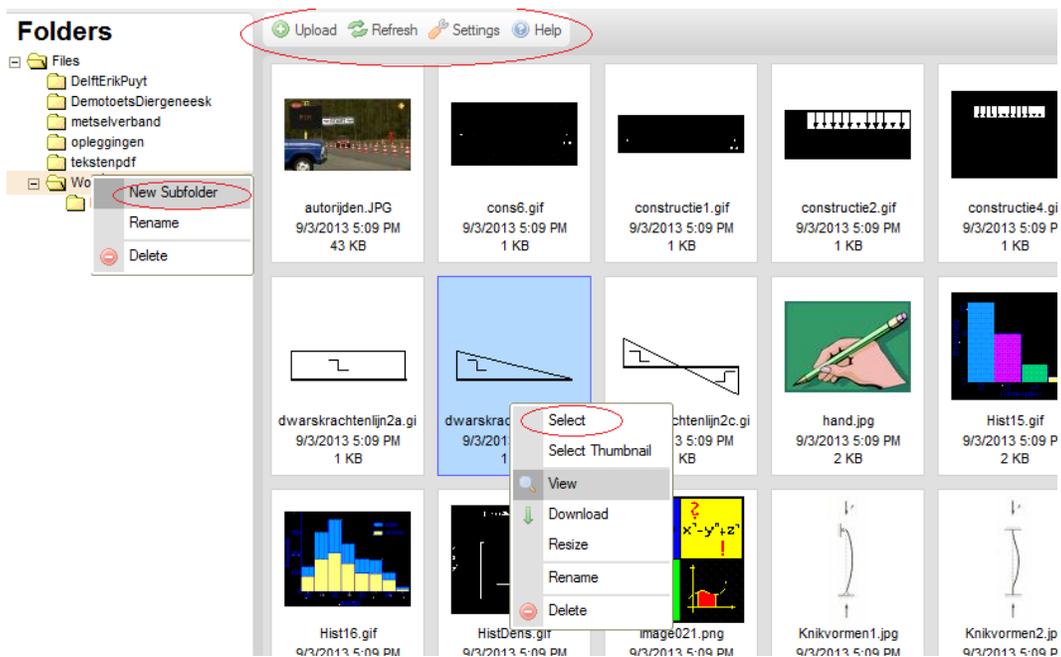


Figure 1.40: uploading images and organize them in the folders

There you will see an overview of the folder structure as it has already been created in the *Class File Manager* at *View Files* of your Class.

If you click on one of the folders, all the images in it will be visible and you can choose one at your leisure to appear in the text of your Question. Then double click on the image or right-click on the relevant image and choose *Select*.

Some Hints

- You can also **change the name of a picture** on site (click with the right mouse button on the picture). However, there is a danger that if the relevant picture has already been used in another item, it can no longer be found there if you have given it a different name in the meantime. **So extreme restraint with this!!!**

In the *Class File Manager* at *View Files* you certainly cannot rename the images. There is no other option but to throw it away and re-upload it with a new name. But renaming an image can be done this way. You can also rename the image and upload a new image with the new name. The old will then remain and there is no longer a danger that the image will no longer be shown in possible other items due to the renaming. Sometimes people want to rename the picture in view of the possibility that the name of the picture reveals the answer to the question!

- With the settings at *Settings* you can still adjust the way the images are presented here in this situation. Even from this situation you can also upload new images (or documents) from your hard drive with *Upload*. (Note that the names of the pictures contain no spaces and no diacritics!)

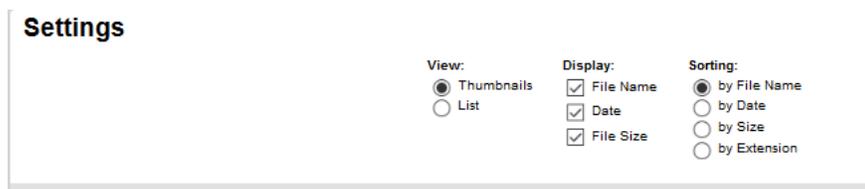


Figure 1.41: Settings of the images

1.8.4 Uploading pictures

The upload of pictures goes as follows with a few hints.

- Starting from the first tab (*Image Info*) from the image dialog, click on *Browse Server*. Then you come to the dialog of folders with pictures. You choose the folder where a new picture should be placed and then browse on your hard drive and upload the picture with *Upload*.

You can also **create new folders** here at the last minute by indicating with the right mouse button in the folder structure where you want to create a new subfolder with *New Subfolder* and ultimately upload a picture from your hard disk. Keep an eye on the folder structure! Advice is not to use *Rename*.

Never use spaces in the names of your folders. If you do so, it will give problems with moving content and that folder is invisible in the *File Manager*.

- Make sure that the names of the pictures can in no way give information about the correct answer to the question. After all, the student can use the right mouse button to get to properties after the name of the picture!!
- Renaming a folder in the image tree is possible but not recommended. It makes everything in that folder unusable if you have previously created items with pictures in this folder. So watch what you do.

- Make sure that the image is already saved with the correct dimensions, so that re-scaling is no longer necessary. If necessary, you can scale on site based on the picture. Keep in mind that if the image is used in other items, it can also have a different size there.
- Pictures can also be included in the text line and not centered if very small pictures are involved. With settings at *Alignment* in the dialog, you get the picture more or less where you want it.
- If you have a special *Group* in the *Content Repository* on a certain topic, make an accompanying folder with pictures that belongs to this *Group*. It is useful then, when moving a group of items, that automatically the folder in which the image is also moves.

1.8.5 Pop-up window

It is often useful to read a document in a popup window, or to place a PDF with formulas or tables. Create an html file (for example in another program: "File.html") and load it into the *File Manager* of the Class.

It can also be a PDF or something else (but not a Word document), or you can link to any other page on the Internet.

The effect is that when clicking on the text, a pop-up of prescribed size appears, which can simply be clicked away.

It is not possible to change anything in the address bar of that pop-up to go to other addresses.

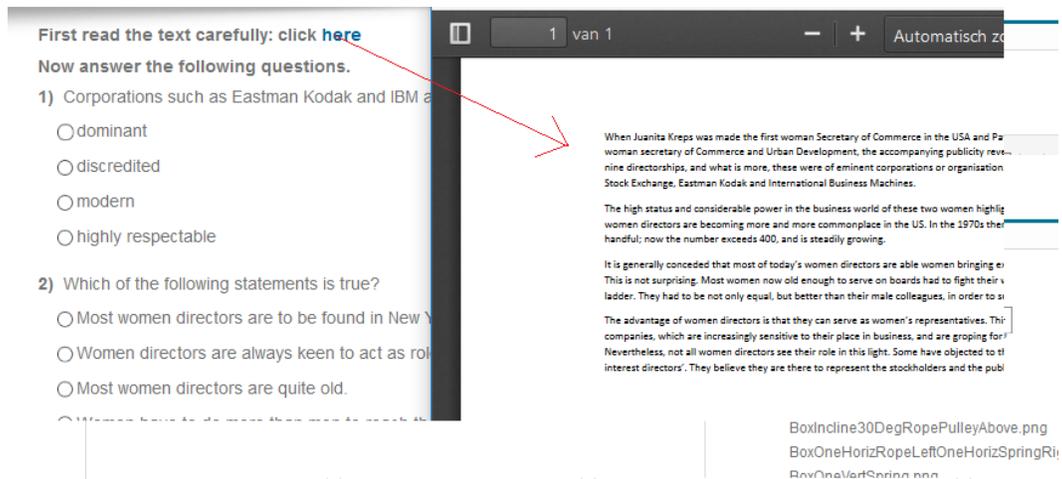


Figure 1.42: Text to read in a pop-up window

In the *Question Text* editor, select a word (or a picture)

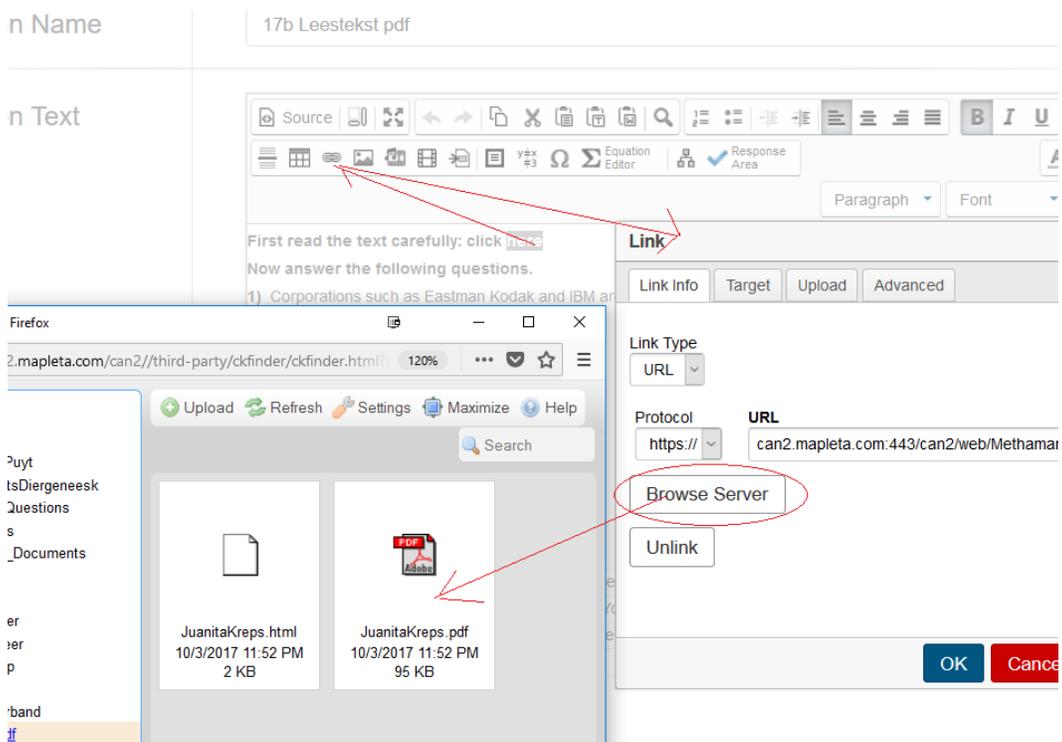


Figure 1.43: Making a pop-up window

Then click on the *Link* button in the toolbar at the top. A dialog will appear in which you can make various settings.

For example, you can use *Browse Server* to go to a document in the *Class File Manager*, or you can navigate to a page on the web. In the first case, click on the relevant file (pdf or html or a picture).

Then go to the *Target* tab, see the figure below.

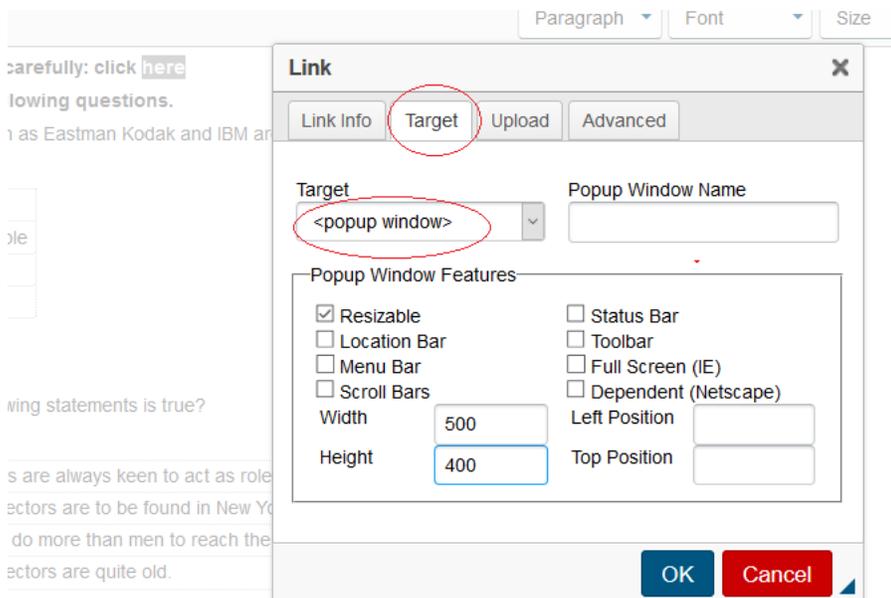


Figure 1.44: Settings for the pop-up window

In this dialog you can make the desired settings of the intended pop-up screen.

1.8.6 iframe for a movie

To show a movie in an iframe, use the following button:

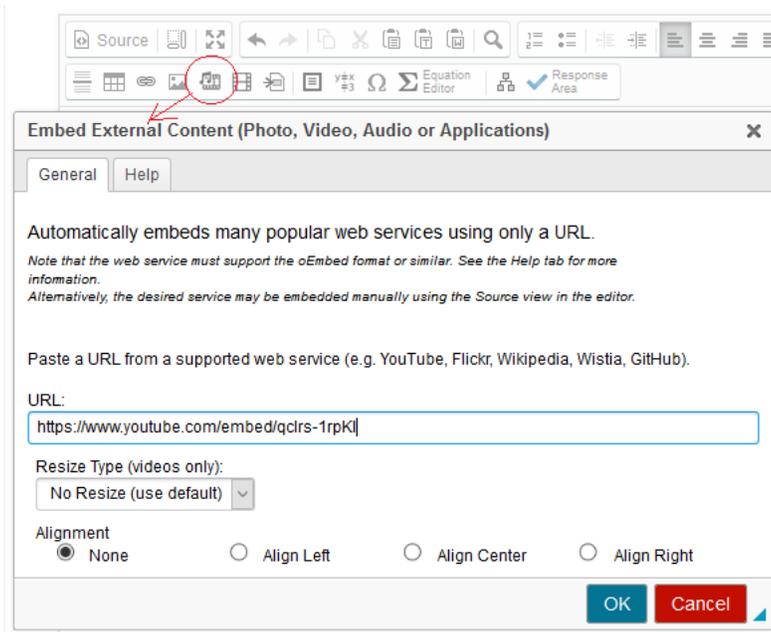


Figure 1.45: Insert a movie

The result can be seen in the following figure:

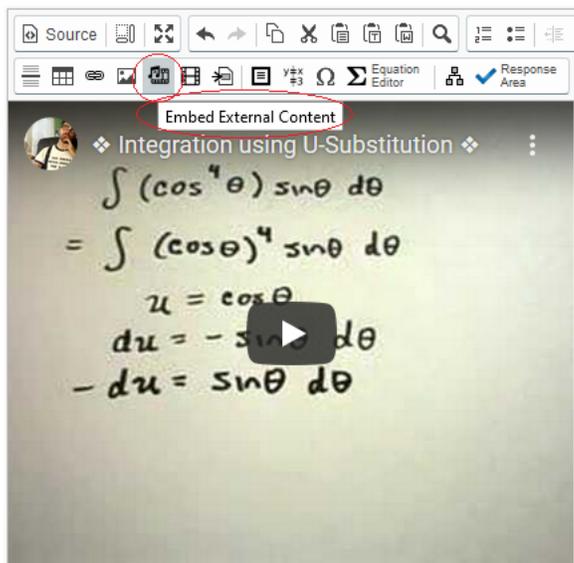


Figure 1.46: A movie in an iframe in text or feedback

Great for feedback to refer to teaching materials somewhere on the web.

HINT: Please note that you do not refer to external sources in the *Question Text* if you are going to use the Question in an Assignment that requires a *Proctored Browser*.

1.9 Different question types

More than one answer fields (*Response Area*) are possible in each Question. You choose a specific *question type* for each answer field. Depending on the type of question you ask, each answer field has its own character.

It is therefore possible that within one item (Question) there are more answer fields of different types. These answer fields can also all be given a different weight, so that the points reserved in a test for this Question as a whole are distributed proportionally according to weight over the answer fields of the Question.

An example of what such a Question might look like is the following figure:

In een fabriek wordt de kwaliteit gecontroleerd van uitgaande producten.

De employé die de controle verricht, blijkt 2% van alle goede producten af te keuren en verder keurt hij 4% van alle slechte producten af.

De totale productie bestaat voor 90% uit goede producten.

Vul in de velden alleen getallen in met één cijfer achter de decimale punt.

	goedgekeurd	afgekeurd	totaal
goed	Number	Number	Number
slecht	Number	Number	Number
totaal	Number	Number	100

Bereken uitgaande van de ingevulde tabel de volgende kansen:

a) Bereken de kans in procenten dat een willekeurig product goed is én goedgekeurd wordt.

Number

Schrijf hieronder hoe je het berekend hebt.

📄 🔄 ↶ ↷ 📄 ✂ 📄 📄 🔍

☰ ☰ ☰ ☰ ☰ ☰

Ω Σ Equation Editor

A A I_x

B I U S x₂ x²

Styles Font Size

Figure 1.47: Example of a composite Question with more answer fields

Above you see more answer fields are offered in one Question. You see *Numeric* answer fields (Number). For more information about this question type see section *Numeric Response Area* (page 44). There is even a field to type in a story, which is the *Essay* type (see section *Essay Response Area* (page 51)).

The answer field (*Response Area*) you insert with the check mark in the button bar *Figure 1.48* (page 39).

You can then choose the type of answer field from 15 options. Many of these options are discussed here.

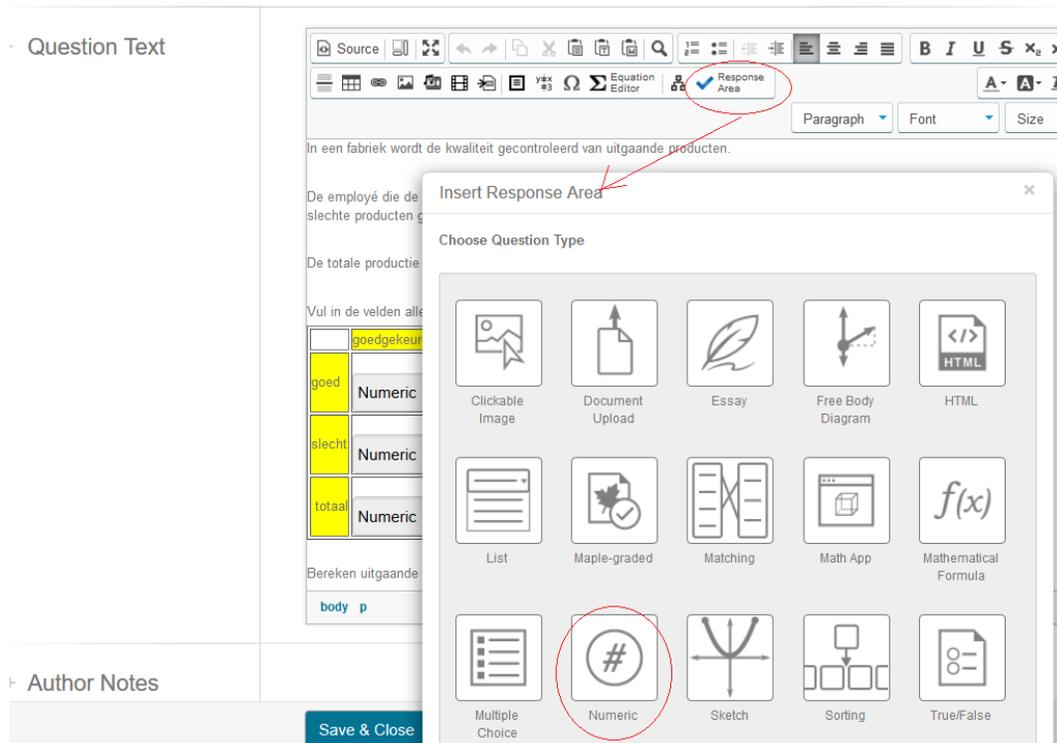


Figure 1.48: Insert a Response Area

After the dialog box (*Response Area*) has been activated by clicking the button with the check mark, the answer field still has to be defined and filled in in terms of type. Here you define the answer field of the *Numeric* type to test a number. For more information, see section *Numeric Response Area* (page 44).

Below are some question types that can be assigned to answer fields.

More of these answer fields can be included in the same Question. There is no limit to the number.

TIP: If you are going to create a very extensive Question with a lot of answer fields where the answers of some answer fields have to be used for the next answer fields, you should know that you can always switch to adaptivity. A Question has all the possibilities to make it an *Adaptive Question*. More information about this can be found in section *Adaptive Question Designer* (page 75).

When all the answer fields are finished, you can confirm everything with *Save & Close* (blue button at the bottom) and then you still have to organize the newly built Question in the tree of the *Groups*, using *Details* in the *Overview of the Question*. See section *Overview of the Question* (page 16).

1.9.1 Multiple Choice Response Area

In an earlier section *Structuur van een toets item* (page 10) an example of entering an answer field with *Multiple choice question type* has also been given.

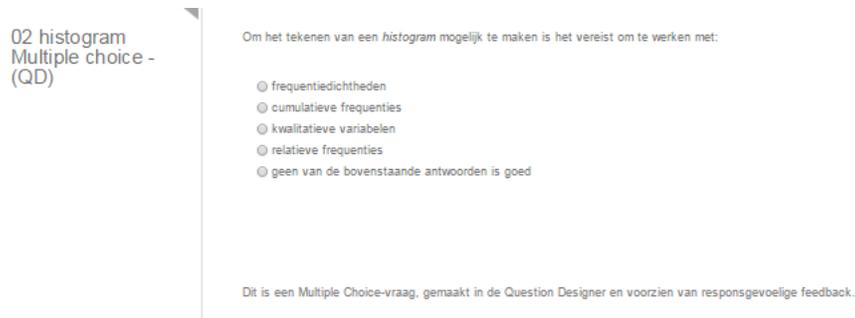


Figure 1.49: Multiple Choice with response specific feedback

After you have clicked the check mark in the text field of the item to create a *Response Area*, where you opt for the question type *Multiple Choice*. You will enter the dialog box of Figure 1.50 (page 40).

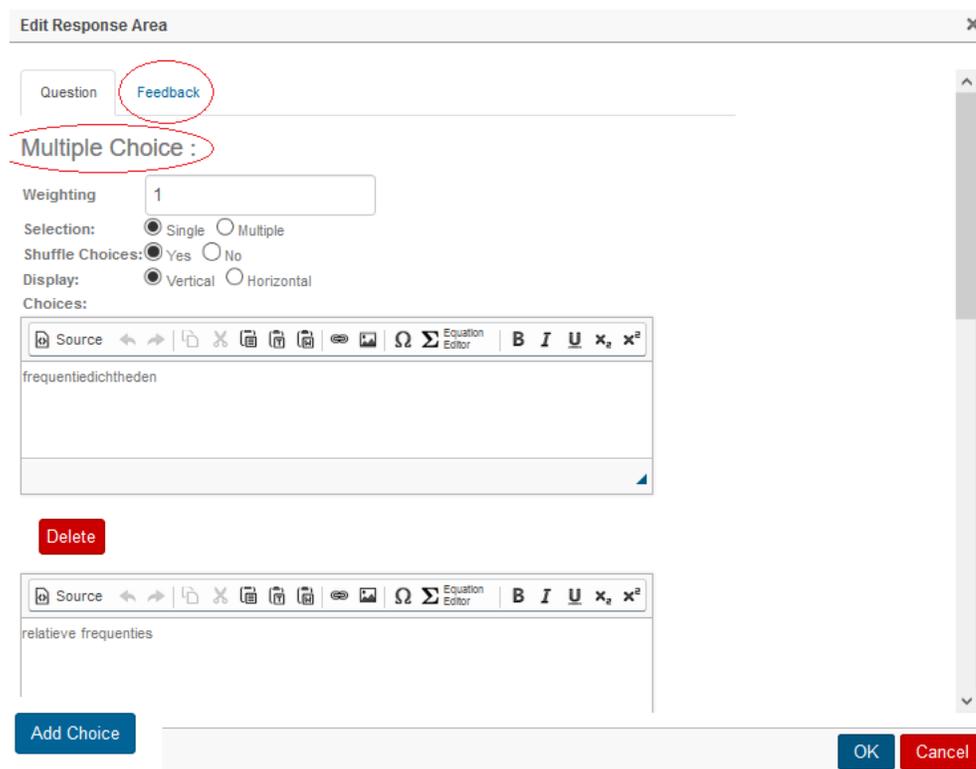


Figure 1.50: Multiple Choice Response Area

You will then automatically receive a dialog box with the settings associated with this question type.

- The *Feedback* tab is for the feedback that appears in the *How did I do* situation of an Assignment or Lesson.
- *Weighting* = 1 means that, if there are more answer fields in the Question, a distribution of points is made according to the weight of each answer field divided over the entire Question. This *Weighting* can only be a positive integer, or 0.

For example, if within an *Assignment* (test) 4 points are given for the entire Question and the *Weighting* of one field is 1 and of the other field is 3, then the distribution is clear for assigning the number of points for the Question as a whole.

- *Selection*. It is possible to choose one alternative correct (*Single*) or more alternatives correct (*Multiple*). In the latter case, the radio buttons turn into checkboxes that the student can check.
- *Shuffle*. You choose whether or not to offer the alternatives interchangeably.
- *Display*. The alternatives can be offered below each other (*Vertical*), but also next to each other (*Horizontal*) if that fits in view of the type of alternatives that may be small and can also be offered next to each other from the point of view of saving space (sometimes pictures that then come next to each other).
- *Choices*. The alternatives must be listed in the part of the form below. There is a limited number of layout options, but with the *Source* button, you can use some extra html tags. You can insert images with the appropriate button.

HINT: You can also enter a formula by clicking on the button with the Sigma character (Σ). However, often the MathML-encoded formula is already prepared in the *Algorithm* section or alternatively you use html tags or LaTeX in the source code.

HINT: By clicking on the OK button, you go to the next form to select the correct answer. Sometimes the blue *OK* button and the red *Cancel* button are not visible and you do not get them to appear with the slider. Then use the roll mouse and the [Ctrl] key to make the image on the screen a bit smaller. You will then see the buttons.

Figure 1.51: To opt for the correct answer and formulate response specific feedback

In the figure above *Figure 1.51* (page 41) it can be seen that all the alternatives, here from 1 to 5, that were filled in in the previous form, are now ready.

1.9.1.1 Randomizing Multiple Choice questions

At Möbius, the possibilities of randomization are a powerful means to give items a different look and in this way you can use your items more often.

In the figure *Figure 1.51* (page 41) you may have seen that there is also a possibility to fill in an *Algorithmic Variable* to indicate which is the correct answer.

"You can also use an algorithmic value to specify the index of correct answer."

In the section *Algorithm* you can prepare the number of the correct answer.

We explain that here with an example.

Hoe hoog is de CN-tower?	Hoe hoog is de Domtoren Utrecht?
<input type="radio"/> 300 m	<input type="radio"/> 300 m
<input type="radio"/> 30 m	<input type="radio"/> 200 m
<input type="radio"/> 100 m	<input type="radio"/> 30 m
<input type="radio"/> 200 m	<input type="radio"/> 100 m
<input type="radio"/> 400 m	<input type="radio"/> 400 m

Figure 1.53: Randomisation Multiple Choice

The figure above shows two versions of the same Question. The tower is always a different one and so the right answer is also different. This is prepared in the *Algorithm* as follows:

```
$index=rint(3);
$toren=switch($index, "CN-tower", "Oldehove", "Domtoren Utrecht");
$antw=switch($index, 1, 2, 3);
```

In the multiple choice answer field you offer 5 different alternatives.

The height 300 m belongs to the CN tower (first answer), 30 m belongs to the Oldehove (second answer) and 100 m belongs to the Dom in Utrecht (third answer). Furthermore, a few extra wrong answers are given.

You can also just choose *Shuffle Yes* or *No*, that does not matter.

The variable \$antw therefore gives the correct answer appropriate to the question.

In the following form after clicking *OK*, the correct answer and any response specific feedback must be filled in:

Edit Response Area ✕

Please select the correct value(s).

(1) 300 m fixed
 (2) 30 m fixed
 (3) 100 m fixed
 (4) \$antwf1 m fixed
 (5) \$antwf2 m fixed

You can also use an algorithmic value as the correct answer

Correct Answer:

Use Response Specific Feedback

(1)
 (2)
 (3)
 (4)
 (5)

Figure 1.54: Algorithmic variable for the correct answer of the Multiple Choice question

In the figure above you can see that you should definitely not select a radio button, but in the field for the *Algorithmic Value*, the correct index is now filled in with the variable \$antw prepared in the *Algorithm* section. (Note the count of the alternatives, which just starts at 1 and with the *Correct Answer* you just have to fill in \$antw and that must be a number 1, 2, 3, 4 or 5.)

1.9.2 Numeric Response Area

The *Question Type Numeric* is especially for the grading of numbers where it is possible to choose an exact answer or possibly accept a margin in the answer. In the following example, the Question contains two *Numeric* answer fields.

Een bedrijf dat auto's verhuurt, rekent een prijs van € 50 per stuk.
 Na jarenlange ervaring is de volgende kans tabel opgesteld over het aantal (k) verhuurde auto's per dag.
 Per dag zijn er ook altijd nog kosten voor het bedrijf en dat is gemiddeld per dag € 100 .

k	0	1	2	3	4	5
$P(k = k)$	0.06	0.13	0.26	0.22	0.06	0.27

a) Bereken de verwachtingswaarde voor het aantal verhuurde auto's per dag in twee decimalen.

Number

b) Bereken de winst in Euro's per dag in twee decimalen

Number

Deze vraag bevat twee numerieke antwoordvelden met marge.

Figure 1.55: Numerieke Response Areas

This figure shows two answer fields (*Response Areas*). These are of the question type *Numeric* (Number). (See *Figure 1.57* (page 46).)

Furthermore, a table in the Question was also used and the numbers in the table are variables prepared in the *Algorithm* section. Furthermore, bold and underlined have been used and that can easily be done with the layout buttons.

See in the sections *Tables and colors in the presentation of the question* (page 20) and *Numbers, characters, links and fonts in the question presentation* (page 23).

Extensive use has been made of the *Algorithm*. Also the correct answer has been prepared in the *Algorithm*. If necessary, you can already see how that works with an explanation in paragraph *Randomisation* (page 50).

Algorithm

Edit the code for your algorithm in the text box to the right, or click "Show Designer" to use the algorithm designer. The algorithm designer tool allows you to define algorithms for your question by completing a form.

[Show Designer](#)

[Refresh algorithm preview](#)

```

Spk0 = decimal(2,rand(0.05,0.15));
Spk1 = decimal(2,rand(0.1,0.2));
Spk2=decimal(2,rand(0.2,0.28));
Spk3=decimal(2,rand(0.2,0.25));
Spk4=decimal(2,rand(0.05,0.1));
Spk5=1-Spk0-Spk1-Spk2-Spk3-Spk4;
SE=Spk1+2*Spk2+3*Spk3+4*Spk4+5*Spk5;
SEwinstfietsen=SE*10-20;
SEwinstautos=SE*50-100;
SEwinstcaravans=SE*100-200;
Sindex=rint(3);
Svervoermiddel=switch(Sindex,"fietsen","auto's","caravans");
Sprijs=switch(Sindex,10,50,100);
Skosten=switch(Sindex,20,100,200);
Santwoord=switch(Sindex,SEwinstfietsen,SEwinstautos,SEwinstcaravans);
          
```

Figure 1.56: Algorithm of the Question

You are going now to the *Question Text Figure 1.57* (page 46).

The screenshot shows a question editor interface. At the top, there is a toolbar with various icons and text formatting options (A, B, I, U, S). Below the toolbar, the question text is displayed. A table is embedded in the text, and two numeric answer fields are visible. A red circle highlights the 'B I U S' buttons in the toolbar. A red arrow points from the 'Table' button to the table. Another red arrow points from the text 'Double-click the response area to edit' to the first numeric answer field.

Een bedrijf vervoermiddel verhuurt, rekent een prijs van € \$prijs per stuk.
 Na jarenlange ervaring is de volgende kansstabel opgesteld over het aantal (k) verhuurde \$vervoermiddel per dag.
 Per dag zijn er ook altijd nog kosten voor het bedrijf en dat is gemiddeld per dag € \$kosten .

k	0	1	2	3	4	5
$P(k = k)$	\$pk0	\$pk1	\$pk2	\$pk3	\$pk4	\$pk5

a) Bereken de verwachtingswaarde voor het aantal verhuurde \$vervoermiddel per dag in twee decimalen.
 Numeric

b) Bereken de gemiddelde kosten per dag in twee decimalen.
 Numeric

Deze vraag bevat twee numerieke antwoordvelden met marge.

Figure 1.57: Question Text

There are buttons to create tables (*Table*) and bold and underlined and italic text (**B I U**).

The dollar signs for calling the variables listed here in the table can simply be typed in using the keyboard.

The first numeric answer field was created using the check mark in the toolbar and if it has already been created, you can adjust it. Then double click on the answer field and you will be in the next dialog box *Figure 1.58 (page 46)*.

The screenshot shows the 'Edit Response Area' dialog box. The 'Question' tab is selected. The 'Numeric' section is active. The 'Weighting' is set to 1. The 'Numeric Part' is set to \$E. The 'Units Part' is empty. The 'Numeric Format' section has checkboxes for 'Accept 1000s separator', 'Accept scientific notation', 'Accept \$ sign', and 'Accept arithmetic'. The 'Required with:' dropdown is set to 'Margin of error'. The 'Margin of Error' dropdown is open, showing options: 'Absolute accuracy', 'Set # figures', 'Margin of error', 'Margin in n'th digit', and 'Percentage margin'. The 'OK' and 'Cancel' buttons are at the bottom right.

Question Feedback

Numeric

Weighting: 1

Numeric Part: \$E

Units Part:

Numeric Format:
 Accept 1000s separator
 Accept scientific notation
 Accept \$ sign
 Accept arithmetic
 -1234.0; 23 - 1257

Required with: Margin of error

Margin of Error:
 Absolute accuracy
 Set # figures
 Margin of error
 Margin in n'th digit
 Percentage margin

OK Cancel

Figure 1.58: Dialog box of the Numeric answer field

You see *Figure 1.58 (page 46)* the *Numeric* dialog box for all the settings of this question type.

- First the weight of the answer field with *Weighting* and then the correct answer that is entered as a variable \$E, because this answer is already prepared in the *Algorithm* section. (See explanation in section *Randomisation (page 50)*.)
- In the field below (*Units Part*) a unit can be entered. That has not been done here and in that case no answer field for units is created for the student. If something is entered in the field at *Units Part*, for example kg, then the field for the answer is automatically linked to the field for the unit, so that it does not matter whether the student enters, for example, 5 kg or 5000 g. See also in section *Numeric field with units (page 48)*.
- Then the numerical answer can be given by the student in a certain form where, for example, scientific notation is allowed or not, for example 5.3E+4 or something similar. This can all be set at *Numeric Format*.

HINT: It is not wise to *Accept 1000s separator* (komma) to minimize confusion with the decimal point. Spaces may always be given by the student, but they are ignored in the answer. However, in financial matters, the comma is sometimes used to separate thousands.

If you opt for *Accept 1000s separator*, the student may enter the number with or without 1000s separator (comma). However, the answer of large numbers in the feedback is presented with the correct answer in any case with a thousand separator. If you prefer not to have that, do not check this choice. In the feedback, therefore, there will be no thousand separator with the correct answer.

- It may be useful to check *Accept arithmetic* in some cases. In that case, the student can enter the answer in the form of a calculation, for example $5*9*10^3/(2*16)$. This can have advantages in case no calculator is allowed on the test or if it is graded whether the student can reconstruct the number with a calculation. Later it can be found out where the misconceptions of the student are, better than that it is wrongly typed on the calculator and one does not know where the error has been.
- Finally, under *Required with* and *Margin of Error*, you can make the settings for the accuracy within which the answer must be given. Possibilities with number of decimal places (inconvenient if units also have to be entered) and possibilities with the number of significant digits or the percentage margin of error.

With *OK*, everything from this answer field is confirmed and if the form of the *Question Text* is finished, you can click on *Save & Close* to complete the Question. Then you organize the Question in the tree of the *Groups* if that is not already done with *Edit Details*.

HINT: Prepare the correct answer (in the *Algorithm* section), for example, with the correct number of decimal places or with or without a thousand separators, so that the feedback corresponds to what the student should enter. See the section on numbers in the presentation of the Question when it comes to the occurrence of a thousand separators in the *Question Text (page 23)*.

Other settings for a margin in the correct answer are also possible such as:

- *Absolute accuracy* if the answer must definitely be exactly the same as what is matched with. In that case, this can be combined with the specifications for the format of entering (*Specify input format*) that, for example, the student may also give the answer as a calculation (*Accept arithmetic*).
- At the setting *#Figures*, you can opt for the number of significant figures with which the answer must be given. This is widely used in physical and chemical calculations. In addition, the setting can be combined with the setting that scientific notation is also accepted (*Accept scientific notation*).
- Sometimes the instructor does not want units but a number that the student must round to two decimal places, then settings such as *Accept +/- err en Accept +/- k in nth place*. It is then

advisable to prepare the number with which the student's answer is matched in the *Algorithm* section with the correct number of decimal places.

- Also make sure that you do not use a thousand separators in the feedback (the comment) so as not to mislead the student.
- Please note that if there are dollars in the game, the dollar sign can be accepted by checking the relevant checkbox.
- Just make sure you have set enough margin if the number can also be entered in calculator language. Pay attention to what the student's answer is matched with, or that is the rounded number, or the exact unrounded number.

HINT: If you want to give a pre-programmed variable for the *Margin of Error*, you cannot do so with this question type *Numeric*.

HINT: Do not choose *Accept arithmetic* and *Accept scientific notation* at the same time. They bite each other.

HINT: See section *Numbers* (page 23) how to deal with big numbers and 1000s separators.

1.9.2.1 Numeric with units

You can also attach a *unit field* to the *numeric answer field* as shown in the example below. In the test, the student can stand in the *Number field* with the mouse and receives information using a link about this numeric field. Exactly the information about the settings you have prepared.

Bereken de kinetische energie van een voorwerp met massa 6 gram en snelheid 21 m/s.

Bereken de kinetische energie en geef de eenheden er ook bij.

Number Units

Dit is een numerieke vraag met een procentuele foutmarge in verband met de eenheden.

- [Number Help](#)

Number Help ×

Numeric entries can be read by the system in the following styles:

- Thousands separators should not be used. Enter 1234 instead of 1,234.
- Dollar signs will not be accepted in your answers.
- Scientific notation may not be used. Enter numbers in decimal form like 0.0035, and *not* 3.5E-3.
- You can enter arithmetic expressions for your answer. For example if you enter 2.35+0.11 the system will grade it as though you had entered 2.46.
- Negative numbers are denoted with a minus sign. For example, -27.5.

[Close](#)

Figure 1.59: Information about the settings of number

If the student is placed on the *Units field* in the test, he will be offered a link in which all permitted units are mentioned. The student makes combinations of units with the ordinary calculation rules such as m/s and the like.

Bereken de kinetische energie van een voorwerp met massa 6 gram en snelheid 21 m/s.

Bereken de kinetische energie en geef de eenheden er ook bij.

Number Units

Dit is een numerieke vraag met een procent

- Units Help

Units Help

The Unit column of the following tables display all of the units that are recognized by the system. You can use either the units themselves, or combinations of these units, for example kJ/mol, kg*m², or m/s/s. The system accepts equivalent answers with different units as long as both units are accepted in the system. That is, if the answer is 120 cm, then 1.2 m or 1200 mm will also be accepted as correct.

SI/Metric Units (Accept Prefixes)

The units in this section can each be prefixed with one of the accepted SI prefixes below.

SI Prefixes			Base Units		
Prefix	Factor	Name	Unit	Definition	Name
Y	10 ²⁴	yotta	m		meter
Z	10 ²¹	zetta	s		second
E	10 ¹⁸	exa	kg		kilogram
P	10 ¹⁵	peta	A		amp
T	10 ¹²	tera	K		kelvin
G	10 ⁹	giga			
M	10 ⁶	mega			
k	10 ³	kilo			
h	10 ²	hecto			
da	10 ¹	deca			
d	10 ⁻¹	deci			

Derived SI Units		
Unit	Definition	Name
mol	6.02214199 * 10 ²³	mole
rad	1	radian
sr	1	steradian

Figure 1.60: Information about the settings of unit

HINT: For item creators it is wise to see which units are allowed and how to prepare them.

In the design of the item, you can enter a unit part in the field under *Numeric Part*, as shown in the following figure.

Bereken de kinetische energie van een voorwerp met massa \$m\$ gram en snelheid \$v\$

Bereken de kinetische energie en geef de eenheden er ook bij.

Numeric with Units

Edit Response Area

Question Feedback

Numeric

Weighting: 1

Numeric Part: \$Ek

Units Part: J

Numeric Format:
 Accept 1000s separator
 Accept scientific notation
 Accept \$ sign
 Accept arithmetic

Required with: Percentage margin

Margin of error: 1.0

Figure 1.61: Enter units in the design of the Numeric question

If you do not enter a unit in *Units Part*, then in that case no answer field for units will be created for the student.

If something is entered in *Units Part*, for example J (joule), the field for the *Numeric Part* of the answer is automatically linked to the field for the unit, so that it does not matter whether the student enters, for example, 5 kJ or 5000 J. If you do create an extra field for the unit belonging to the number, then information is offered [Units] in the question for the student to see which units have which abbreviations. This is offered by default and cannot be made invisible.

HINT: Take a look at the units and note that, for example, dm (decimeter) and hm (hectometer) are not accepted. Composite units such as square meters should always be entered in a logical way. After all, square meter means m^2 or $m*m$ and the student can enter as such, so do not enter with $m2$ or something similar. For example, entering the newton can be done with N or $kg*m/s^2$ or full newton (with lowercase character).

HINT: In the case that the student does need to enter units, it is not useful to set the number of decimal places as a margin of error, but perhaps it is better to specify a percentage as a margin, even if the student still uses the calculator if you have set *Accept Arithmetic*. Here the margin of error is 1 percent taken.

1.9.2.2 Randomisation

Here you will find an example of a simple randomisation.

In the *Algorithm* of the question *Figure 1.56 (page 45)* you can see that for the purpose of randomization, a number of variables, recognizable by the dollar sign, have already been prepared that can be called and used anywhere throughout the Question. Not only the numbers are

randomized, but textual randomization using the Möbius command `switch` has also been used here.

(Look in the separate manual *Randomisation* for more information about randomisation.)

Here is a brief explanation of the *Algorithm*.

```
$pk0 = decimal(2,rand(0.05,0.15));
$pk1 = decimal(2,rand(0.1,0.2));
$pk2=decimal(2,rand(0.2,0.28));
$pk3=decimal(2,rand(0.2,0.25));
$pk4=decimal(2,rand(0.05,0.1));
$pk5=1-$pk0-$pk1-$pk2-$pk3-$pk4;
$E=$pk1+2*$pk2+3*$pk3+4*$pk4+5*$pk5;
$index=rint(3);
$vervoermiddel=switch($index,"fietsen","auto's","caravans");
$prijs=switch($index,10,50,100);
$kosten=switch($index,20,100,200);
$Ewinstfietsen=$E*10-20;
$Ewinstautos=$E*50-100;
$Ewinstcaravans=$E*100-200;
$santwoord=switch($index,$Ewinstfietsen,$Ewinstautos,$Ewinstcaravans);
```

Six probabilities (\$pk 0 to \$pk 5) for the six probability variables have been determined at random. Each probability is always a number with two decimal places between 0 and 1. The variable \$pk 5 is equal to 1 minus the sum of the other probabilities.

The mean value of the probability variable has already been calculated here and is the variable \$E. That is the answer that must be filled in by the student in the first answer field. *Figure 1.57 (page 46)*.

There is now also a **textual randomization** here where it can be about bicycles one time and the other time about cars and possibly also about caravans. With the help of the `switch` function, you can always switch between one and the other.

The variable `$index=rint(3)` is a function that generates a random integer (here it is 0 or 1 or 2, so three possibilities).

So it means that if `$index = 2`, then caravans with a price of 100 and cost of 200 correspond. Because the second answer field (*Figure 1.57 (page 46)*) (the profit) depending on the data of means of transport, price and costs, the corresponding answer is also always different.

The three variables `$Ewinstfietsen`, `$Ewinstautos` and `$Ewinstcaravans` have already been prepared and with the help of `switch`, depending on the value of the variable `$index`, the correct answer is generated. The last variable `$antwoord` is the correct answer for the second answer field.

1.9.3 Essay Response Area

Sometimes it is useful to create a field where the student can tell a story. The student then has all kinds of possibilities to shape his story with buttons for the layout. For example, you can offer an answer field for the answer during calculations, but you can add an extra answer field in which the student can indicate how he got the answer.

Vul in de velden alleen getallen in met één cijfer achter de decimale punt.

	goedgekeurd	afgekeurd	totaal
goed	Number	Number	Number
slecht	Number	Number	Number
totaal	Number	Number	100

Bereken uitgaande van de ingevulde tabel de volgende kansen:

a) Bereken de kans in procenten dat een willekeurig product goed is én goedgekeurd wordt.

Number

Schrijf hieronder hoe je het berekend hebt.

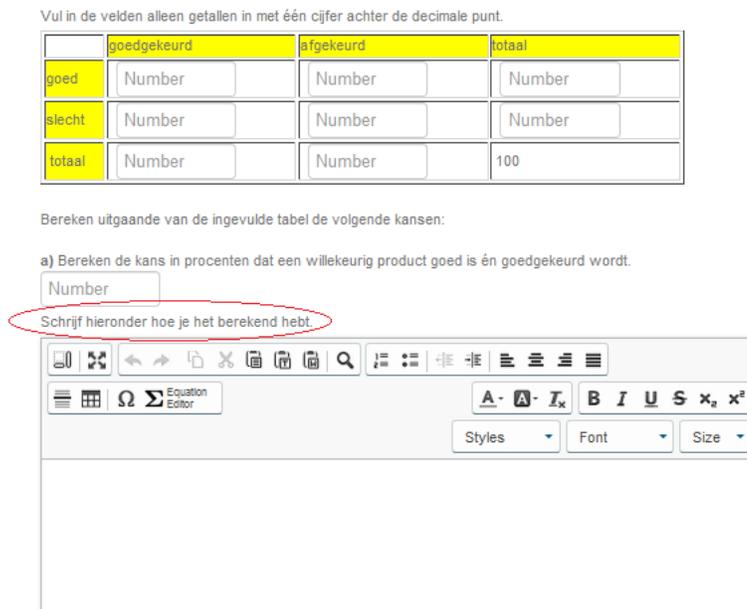


Figure 1.62: Essay question type

Perhaps it is useful not to assign weight to that answer field. If you do assign a weight to it, then a grading is not given for the *Assignment* immediately after the student has pressed *Grade*, because the instructor must then be involved to grade the essay.

Suppose that the given answer to the calculation is wrong, and the student has written down in the field of the *Essay* how he had thought, then the student can later see where the error may have been, with or after consultation with the instructor. Communication with the instructor is also a bit easier if the student can formulate the justification of his answer without receiving points for it. See section *Grading of the Essay question type* (page 53) for the situation if a weight is assigned to the *Essay* and how the instructor can still grade this.

The screen to define the answer field for an *Essay* is quite simple. See the following figure: *Figure 1.63* (page 53).

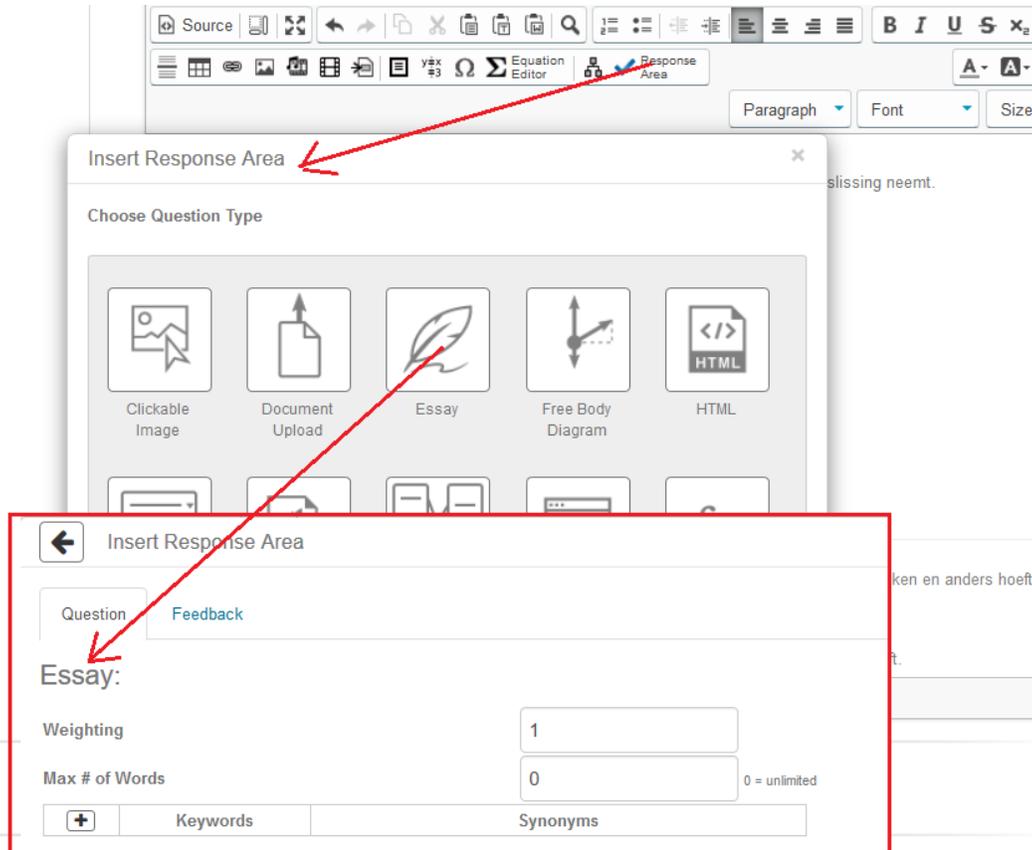


Figure 1.63: Essay question type

- You can or cannot assign weight to this answer field at *Weighting* and after clicking *OK* this field is created.
- The maximum number of words can be set. If there is no limit to the number of words, enter 0.
- There is a possibility to indicate keywords and synonyms for the purpose of reviewing the essay. Because you as an instructor have to do the latter yourself.

1.9.3.1 Grading of the Essay question type

Keep in mind that if a weight is given to a *Response Area* of the type *Essay*, the instructor must always do the grading himself. The instructor then goes to the *Gradebook* and looks at the results *To Be Reviewed* Figure 1.64 (page 53).

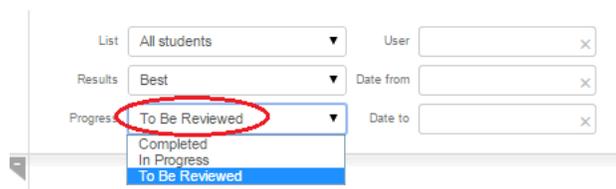


Figure 1.64: Gradebook with option To Be Reviewed

The instructor will then take the grading for each student who has made this question. The administration is then immediately kept up to date and for each student, the grading is then processed immediately after assessment.

1.9.4 List Response Area

With the *List* question type, there are all kinds of interesting possibilities for languages. However, this question type can also be used for the examination of concepts in any other field. Here are a few examples of a linguistic nature.

1.9.4.1 Drop-down Menu

The first example can be seen in the figure below where there are two answer fields each of type *List* with a *drop-down menu*.

The second example *Figure 1.67 (page 56)* is also with the question type *List* but now with blanks where the student has to enter something himself.

For the first example with drop-down menu see *Figure 1.65 (page 54)*.

The screenshot shows a question interface with the title "Fill in a, an, the or – (nothing)". The question text is "She put on (Click for List) apron and started chopping (Click for List) onions." Below the question, there are two drop-down menus. The first menu is open, showing a list of options: "(Click for List)", "a", "an", "the", and "-". The option "the" is currently selected and highlighted in blue. The second menu is closed and shows "(Click for List)".

Figure 1.65: Question type List

In the figure you can see that drop-down menus have been chosen for the answer field.

The student can then choose from offered alternatives from the list.

Open this answer field and you see the settings of this *Response Area* as the figure below.

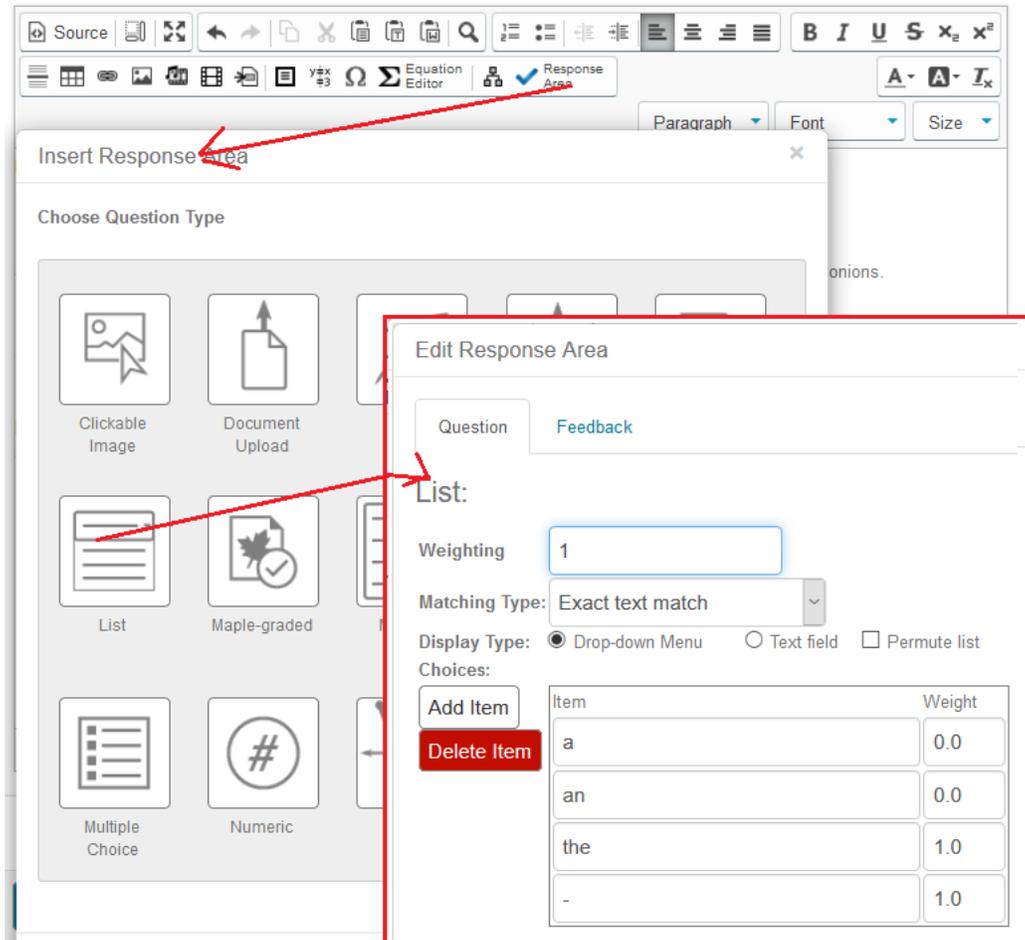


Figure 1.66: Edit Response Area of the answer field List

In the figure above you can see that the choice of the student leads to a score and that there can also be more answers from the offered list, such as here two possibilities that are rated with *Weight* with 1 of Figure 1.65 (page 54).

Other values between 0 and 1 can also be entered at *Weight*. This then indicates a part of the *Weighting* of this answer field. In conjunction with the weight of this answer field as a whole (*Weighting*), the system then eventually arrives at a total score of the Question within a test. You can therefore imagine that for each of the possible answers, partial scores can also be assigned with a number between 0 and 1. This way of doing things is common when testing languages.

With *Permute list*, a different order of the Drop-down Menu is offered each time.

HINT: If more alternatives with 1.0 are rated, then these alternatives will all be included in the feedback.

If you only want to have one alternative in the feedback, do not choose *Weight* 1.0 but 0.9999. The points rating will therefore not change due to completion, but you will achieve that it will not be shown in the feedback.

1.9.4.2 Textfield

Another way to work with this *List* question type is to offer an empty field (blank) where students can type something themselves, as shown in the following figure.

Vul het juiste vraagwoord in bij onderstaande vraagzinnen

1. ¿ es tu cumpleaños?
Mi cumpleaños es el 14 de noviembre.
2. ¿Con practicas español?
Con los clientes.
3. ¿ obreros hay en Torres?
Unos 18 o 20.
4. ¿ es tu casa?

Figure 1.67: List Response Area with blank

If we look at the design of the first answer field in the editor, we come to the following figure.

Edit Response Area

Question Feedback

List:

Weighting

Matching Type: Ignore case text match

Display Type: Drop-down Menu Text field Permute list

Choices:

Add Item Delete Item

Item	Weight
Cuándo	1.0
cuando	0.75

Figure 1.68: To edit the Response Area of type List with blank

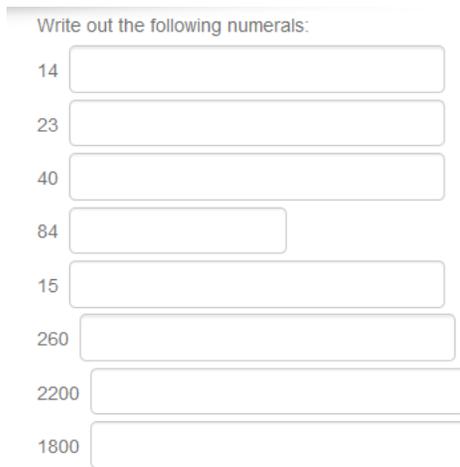
In the figure above, *Textfield* was chosen with the *Ignore case text match* option for *Matching Type*.

That means, uppercase and lowercase characters do not matter. This is done in this case because the word entered is at the beginning of the sentence and should in fact start with a capital. But if the student types it in with a lowercase, it is still correct graded. Furthermore, the student can fill in something that can be partially graded (75%) if, for example, he forgets an accent. This question type *List* gives a lot of possibilities, also because each answer field can be provided with a weight separately.

HINT: Note that only text (also text with quotes) or numbers with this question type can be interviewed with text field settings. MathML code and html code and LaTeX in this not, because then the student would also have to fill in html code to get a 100% grading because of the *Exact Text Match* setting. However, the tags of the html code are ignored in this question type. What is possible is the use of formulas and certain characters if you choose *Drop-down menu*. You can create the characters using key combinations with your keyboard, with LaTeX, or by using

algorithmic variables for formulas. It will be clear that this is only possible with drop-down menus and not with text fields where the student would then have to fill in those characters himself.

HINT: If more text fields (blanks) are offered in the Question, it may well be that the empty boxes are of unequal length where this is not desirable, as in the following figure:



Write out the following numerals:

14	<input type="text"/>
23	<input type="text"/>
40	<input type="text"/>
84	<input type="text"/>
15	<input type="text"/>
260	<input type="text"/>
2200	<input type="text"/>
1800	<input type="text"/>

Figure 1.69: Length of the answer fields

Then work with a dummy answer that is not calculated correctly (*Weight* = 0) and that has the same length for all fields in the Question. This answer is not seen by the student because it is an open text field (so no drop-down). The answer field always adapts to the longest answer.

Write out the following numerals:

14 List Text Field

23 List Text Field

40 List Text Field

84 List Text Field

15 List Text Field

260 List Text Field

2200 List Text Field

1800 List Text Field

Save & Close Save

Edit Response Area

Question Feedback

List:

Weighting: 1

Matching Type: Exact text match

Display Type: Drop-down Menu Text field Permute list

Choices:

Item	Weight
fourteen	1.0
one thousand eight hundred	0.0

Add Item Delete Item

Figure 1.70: Length of the blanks equal

HINT: Another nice example for use with languages is the following:

Using this *List* question type, create one or more blanks where the student must fill in a sentence by copying and pasting and supplement or improve it.

Kopieer de zin in het kader en vul leestekens en hoofdletters aan:

het model heeft als studiegebied de hele stadsregio rotterdam en er worden drie modaliteiten in beschreven auto fiets en openbaar vervoer

Albert Einstein

Het is handig om de student de zin in het kader te laten overnemen met copy en paste en dan te verbeteren. Hou de zinnen kort of maak meer zinnen in verschillende invulvelden, want er hoeft maar één fout in te zitten of de student krijgt voor het hele invulveld geen punt.

Figure 1.71: Extended text fields

Then create a blank and choose question type *List*. Then choose *Text field* and at *Matching Type* this time for *Exact*, because case sensitivity will also play a role here.

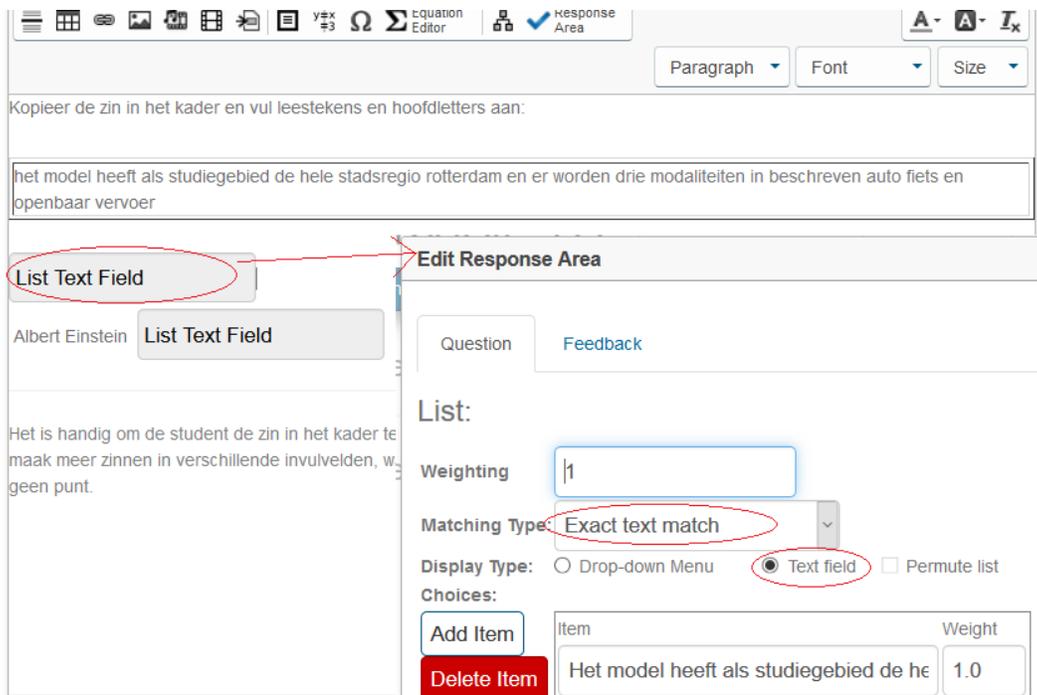


Figure 1.72: Editing extended text fields

The box to fill in the correct answer isn't long enough at the design stage, but it does run through, so you can make your text as long as you want. However, please note that if one thing is not correct, the entire answer field will be incorrectly graded. If necessary, split into shorter parts. Optionally, you can provide even more correct or partially correct answers with the help of *Add Item*.

HINT: For longer texts, it is important to know that both in the *Exact text match* setting and in *Ignore Case text match* when typing multiple spaces by the student, the system always sees this series of spaces as one space.

HINT: If you want to grade more answers correctly in a *Text field*, you can create more items within this answer field and provide them with *Weight* 1. The feedback will then include all these answers.

However, if you want to grade more answers correctly while only one item in the feedback appears as being the correct answer, then you do not appreciate those other answers with *Weight* 1 but with 0.9999 or something like that. In the calculation of the score this is rounded to 1 and in the feedback only the correct answer with *Weight* 1.

1.9.4.3 Regular expression match

With *Textfield* there is a third possibility to grade text where different spellings can be graded correctly. That is with the option *Regular expression match*. All kinds of subsequent characters can then be matched with the correct sequence of characters. For the different possible spellings of an answer, you do not have to enter all the possibilities. With the help of one code, the different spellings can be captured in one go. Note that a space is also a character. The spaces that the student enters are always translated into one space. Quotes (double and single) are also characters.

Example 1: basic knowledge

Edit Response Area

Question Feedback

List:

Weighting

Matching Type: Regular expression match

Display Type: Drop-down Menu Text field Permute list

Choices:

Item	Weight
Metha Kamminga	1.0
[Mm]eth?a [Kk]amm?(i y)ngh?a	0.9999

Figure 1.73: Regular expression match example 1

In the first box, always fill in the correct answer, so that the correct (or most correct) answer is communicated in the feedback in case the student has filled in the wrong way. In the second box you give by means of a code the different spellings of the name "Metha Kamminga" that you want to grade correctly:

[Mm]eth?a [Kk](a|e)mm?(i|y)ngh?a

It means that between square brackets the capital M and the lowercase m are both graded correctly. This is also the case with the capital of the last name, so lowercase k is also calculated correctly.

HINT: Because in the correct answer after grading all options that are rated with Weight 1 are shown, for the coded option you do not give Weight 1 but slightly less for example 0.99999999. That has no effect on the final grading and you achieve that only the option with Weight 1 is shown in the feedback.

HINT: In square brackets, you can place even more characters when it comes to single characters, for example **[KkCc]**. In that case, the student can even get the letter C or c approved. Between the square brackets are therefore all characters that can be approved. No separator should be placed between them.

An alternative to such a choice is with brackets with a straight line between them as a separator: **(a|e)** means that if either the a or the e is noted, both are approved. (This could also have been done with **[ae]**.)

Similarly with **(i|y)** that either the letter i or the letter y is approved at that place. This could also have been done with **[iy]** because it concerns some characters.

This way with brackets and straight line as a separator offers more combination possibilities. For example, you can use **(a|ae)** or **(aa|ae|ee)** to allow more possible spellings. Within these regular brackets and separators you can also use square brackets and the like.

Then the question mark behind a character (here it is the character h) makes the character optional, and this character may possibly be omitted. So both Metha with h and Meta without h are approved.

This coding requires some effort, but will save a lot of "knock-in work" to list all the possibilities and combinations that are out there.

HINT: See the difference between **(K|k|C|c)** and **[KkCc]**.

Both have the same effect that either the uppercase K or C is allowed, or the corresponding lowercase characters.

If you were to use the delimiter in the square brackets, that delimiter also counts as a correct character.

1.9.4.4 Extra possibilities with Regular expression match

Example 2: exclusion of characters

You can also specify which characters are not allowed. The following command is an example of this. Type in: "Finish" preceded by a consonant or a number or a character.

The screenshot shows the 'Edit Response Area' for a question. The 'List' section contains the following items:

Item	Weight
zfinish	1.0
[^aeiou]finish	0.9999

Figure 1.74: Regular expression match example 2

If you allow all characters except certain characters, you can indicate this with the ^ sign at the beginning of a series of characters with square brackets.

For example, the code **[^aeiou]** means all characters except the vowels. (So also characters, spaces, and everything.) The assignment is now:

Type the following: "finish" preceded by a consonant or a number or a character.

You can program that with: **[^aeiou]finish**.

The student could then give a correct answer ffinish or =finish or something similar. Also pay attention to the first item in the figure above. That is the correct answer that will be in the feedback if the student is wrong.

Example 3: character combinations

In the next, you can switch between a single character or a combination of two (or more) characters in that place.

Fill in: **Netherlands, Netherland or Nederland or Nederlands.**

Everything is graded correctly with the following code.

[Nn]e(d|th)erlands?

Figure 1.75: Regular expression match example 3

Edit Response Area

Question Feedback

List:

Weighting:

Matching Type: Regular expression match

Display Type: Drop-down Menu Text field Permute list

Choices:

Add Item Delete Item

Item	Weight
Nederland	1.0
[Nn]e(d th)erlands?	0.9999

This means that both the character d and the character combination th are approved. Here it is useful to work with ordinary brackets and the straight line as a separator. There are then quite a few more possibilities to combine in this way. The s at the end is optional, indicated by the question mark. The capital at the beginning is not mandatory and can also be indicated by a lowercase with [Nn].

HINT: The special characters behind a character mean the following:

s? means that zero or one s may be written.

s+ means that one or more s-s may be written.

s* means that zero or more s's may be written.

HINT: It is of course also possible to give more coded options so that certain combinations can be excluded as shown in the figure below.

Edit Response Area

Question Feedback

List:

Weighting:

Matching Type: Regular expression match

Display Type: Drop-down Menu Text field Permute list

Choices:

Add Item Delete Item

Item	Weight
Nederland	1.0
[Nn]ederland	0.9999
[Nn]etherlands	0.9999

Figure 1.76: Regular expression match example 4a

In the example above, for example, the **Netherland** answer is not correct.

Make sure that in the first box you give the correct answer in any case for the purpose of the feedback.

Example 4: character combinations

If you want to allow a character combination more times, you can do so as described above in the HINT, but with brackets around the character combination. For example, the code **(de)+** can be matched with **dedede**. One or more times of this character combination is then permitted. For example **(de)?** means that the character combination may also be omitted.

Edit Response Area

Question Feedback

List:

Weighting: 1

Matching Type: Regular expression match

Display Type: Drop-down Menu Text field Permute list

Choices:

Item	Weight
chocolade	1.0
chocola((de)? atje)	0.9999

Figure 1.77: Regular expression match example 4

In the example above, the following words are all graded correctly: **chocolade**, **chocolaatje** or **chocola** with the help of *Regular expression match* and the following code: **chocola((de)?|atje)**

Example 5: wild card

A regular dot is also one of the special characters and this means that all characters can be filled in instead (wild card). A dot followed by an asterisks **.*** means that no or more characters can be randomly entered in this place. An example of this can be seen in the figure below.

Edit Response Area

Question Feedback

List:

Weighting: 1

Matching Type: Regular expression match

Display Type: Drop-down Menu Text field Permute list

Choices:

Item	Weight
cardiografie	1.0
.*graf(ie isch)	0.9999

Figure 1.78: Regular expression match example 5

With the following code:

`.*graf(ie|isch)`

is the following graded as correct: **lithografisch** of **geografie** of **cardiografie**, or another word ending with: **.....grafisch** or **.....grafie**.

Example 6: combinations with (...|...|...)

Edit Response Area

Question Feedback

List:

Weighting: 1

Matching Type: Regular expression match

Display Type: Drop-down Menu Text field Permute list

Choices:

Item	Weight
maar	1.0
m(aa? ae ee)r	0.9999

Figure 1.79: Regular expression match example 6

In the figure above we see the effect of the use of parentheses and the different possibilities within them separated by the vertical dash.

More variations are possible with character combinations such as **mar**, **maar**, **maer** en **meer** are all correct with the code `m(aa?|ae|ee)r`.

Here you can within the delimiter (.....|.....) also programming again with square brackets and question marks, plus signs and asterisks and square brackets.

This way gives many combination possibilities. See also later in an additional possibility, for example 8.

Voorbeeld 7: special characters

The characters such as + and * and ? and also the . have a certain meaning as can be seen above. Also the parentheses such as (and [are characters that stand for something as well as the delimiter |.

The \$-character is also a special character in the *Regular Expressions in Maple*. Officially within the computer algebra system Maple, it can be used to close a string and then has a function if it is at the back of a line. However, this function is disabled within Möbius for the possible use of *Algorithmic* variables. See also example 8.

The =-character however, does not belong to these special characters and can simply be considered as a single character.

So if you want to grade a string that explicitly contains the above mentioned characters, it is useful to strip these characters of their special meaning.

There are two ways to negate the function of these special characters.

- This can be done with a backslash that precedes the special character. The backslash `\` is a so-called escape character.
 - It can also be done by placing the special character between square brackets.
- In both ways, the meaning of this special character is lost. In most cases, you can choose between both options.
- In the figure below, it has been decided to place the asterisk `*` in square brackets `[*]`.

Figure 1.80 shows the configuration for a question using regular expression matching. The 'List' section includes a 'Weighting' field set to 1, a 'Matching Type' dropdown set to 'Regular expression match', and 'Display Type' options: 'Drop-down Menu', 'Text field' (selected), and 'Permute list'. Below these are 'Add Item' and 'Delete Item' buttons. A table lists two choices:

Item	Weight
=?C8[*]B3	1.0
=?B3[*]C8	1.0

Figure 1.80: Regular epression match example 7

Here the student is to ask to type the following: `=C8*B3`, or also correct `=B3*C8`, where the `=` sign can be skipped.

This can be done by the following code:

`=?C8*B3`

An alternative is

`=?B3*C8`

Another alternative is

`=?C8[*]B3`

or

`=?B3[*]C8`

HINT: The disadvantage of using these signs is that it is difficult to communicate the correct answer in the feedback. Usually we give the preferred answer as the first option, which is communicated in case of incorrect grading. `B3.C8` (0%) `=?C8[*]B3`

Most of the time, you don't want the parentheses and the whole coding to be seen by the student, as in the feedback above. In this case it would be something to give as the first option `=C8*B3`, but then the student could also enter `=C8888888B3` or even `=CB3` to get a correct grading.

After all, the meaning of an asterisk within *Regular Expression* is that zero or one or more of the character is accepted prior to the asterisk.

You can therefore choose not to use *Regular expression match*. There is nothing to worry about. The signs then no longer have any special meaning.

In that case, you may need some more alternatives to list all the good possibilities, as can be seen in the figure below where you can also choose *Ignore case text match* to make the distinction in lowercase and uppercase not important.

Edit Response Area

Question Feedback

List:

Weighting

Matching Type: Ignore case text match

Display Type: Drop-down Menu Text field Permute list

Choices:

Add Item

Delete Item

Item	Weight
=C8*B3	1.0
C8*B3	0.9999
=B3*C8	0.9999
B3*C8	0.9999

Figure 1.81: Regular expression match example 8a

The top item that is fully graded with 1 is the item that is communicated in the feedback.

Example 8: the \$-sign

It is even more difficult with the dollar sign \$.

Within Möbius, this character represents an *Algorithmic* variable. So be careful with it!

If you want to communicate a \$ character in plain text in Möbius, this character must be preceded by an escape character, i.e. as \\$.

Even if you do not use *Regular expression match*.

So you use \\$ to nullify the meaning of the algorithmic variable.

If you also want to nullify the special meaning of the dollar sign within the *Regular expression match*, there is no other option than to work with square brackets around this character. This is the only way to match a string if there is a dollar sign in it.

Placing a dollar sign in a string without square brackets around it will not match with any string.

(That has advantages, see *Figure 1.82 (page 67)*.)

So with [\\$] you both eliminate the meaning of the algorithmic variable and you eliminate the meaning within *Regular expression match*.

Below is an example where you demand a \$ sign in the student's answer.

Edit Response Area

Question

Feedback

List:

Weighting:

Matching Type: Regular expression match ▼

Display Type: Drop-down Menu Text field Permute list

Choices:

Add Item

Item	Weight
=?[\\$]?[cC][\\$]8[*][dD]3	0.9999
=?[dD]3[*][\\$]?[cC][\\$]8	0.9999
=C\$8*D3	1.0

Delete Item

Figure 1.82: Regular expression match example 8

The correct answer is:

=C\$8*D3 and possibly =SC\$8*D3 is also correct where the = sign may be omitted and the uppercase characters may be replaced by lowercase characters.

You can program this as follows: =?[\\$]?[cC][\\$]8[*][dD]3.

For safety's sake, you also put the dollar sign in square brackets because of the possible "translation" to an algorithmic variable and the meaning of this sign within *Regular Expression match*.

HINT: You could even have captured the above two possibilities in one code by working with parentheses and the vertical dash as a separator. The scheme of this is (.....|.....). The code is then as follows:

(=?[\\$]?[cC][\\$]8[*][dD]3 | =?[dD]3[*][\\$]?[cC][\\$]8)

HINT: You can see that, for example, the correct answer is now given as the last option with *Weight* = 1. But this is only for feedback reason.

After all, if you include a dollar sign in the string, it cannot be matched with any string. So whatever the student fills in can never be matched with =C\$8*D3.

Nevertheless, the correct answer will be communicated in case the student is

wrong: C8*D3 (0%) =C\$8*D3

If you had not given this last item, the correct answer could mislead the student.

=C8*D3 (0%) =?[\\$]?[cC][\\$]8[*][dD]3

Example 9: Diacritics

Diacritics with the characters are neatly included:

Edit Response Area

Question Feedback

List:

Weighting:

Matching Type: Regular expression match

Display Type: Drop-down Menu Text field Permute list

Choices:

Add Item Delete Item

Item	Weight
Curaçao én Aruba	1.0
[cC]ura[çc]ao [ée]n [Aa]ruba	0.9999

Figure 1.83: Regular expression match example 9

The student is asked for typing the following: **Curaçao én Aruba**. You can program that eventually the diacritics may be omitted and that uppercase characters may also be lowercase by programming: `[cC]ura[çc]ao [ée]n [Aa]ruba`.

Example 10: algorithmic variable and the \$ sign

In the following example we see that even the use of algorithmic variables is also possible with *Regular expression match*. In that case, the \$ sign can be used in full because within the program the algorithmic variable is directly converted into its value.

LIST TEXT FIELD

List text field

j) Wij zijn buren en we wonen op de \$a verdieping.
Op welke verdieping wonen jullie dan?

Op de List text field

Edit Response Area

Question Feedback

List:

Weighting:

Matching Type: Regular expression match

Display Type: Drop-down Menu Text field Permute list

Choices:

Add Item Delete Item

Item	Weight
\$a verdieping	1.0
\$a.*	1.0

Figure 1.84: Regular Expression match example 10

In this case, the \$ sign represents the algorithmic variable \$a and thus a set of characters. The combination `$a.*` can be matched with, for example, a supplement something like floor, something that does not substantially contribute to the correct answer.

HINT: The algorithmic variable is directly converted into a number of characters.

You can even use *Regular expression match* to use the algorithmic variable in a bracket expression, i.e. for example, you have to match with **[Sa]**.

If **\$a** stands for "third" then each of the letters in this string is correct. For example, the student only fills in a **d** or an **r** and then this is seen as correct.

1.9.5 Clickable Image Response Area

An example of a complicated scheme about which a question is asked. The right part in the image must be clicked on by the student.

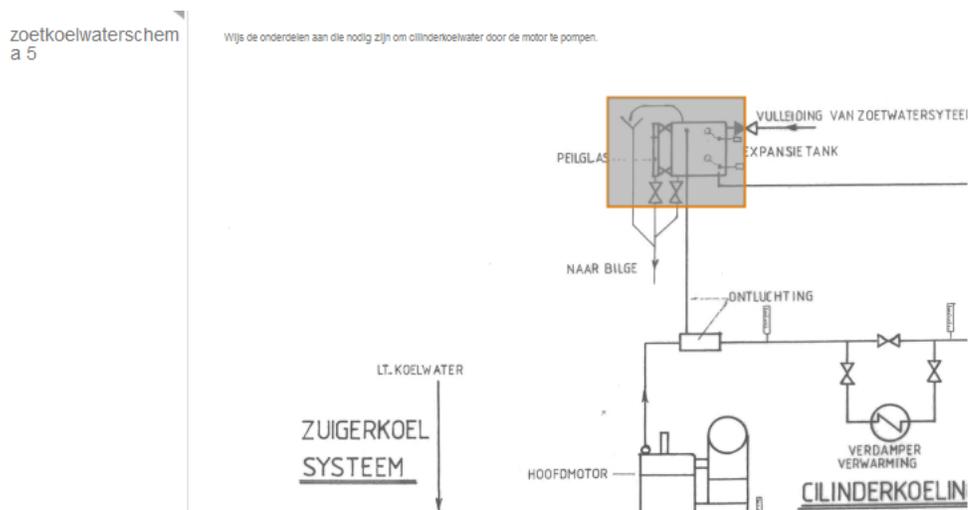


Figure 1.85: Question type Clickable Imagemap

These kinds of answer fields are easy and quick to make!

When creating a new *Response Area*, choose the *Clickable Image* question type.

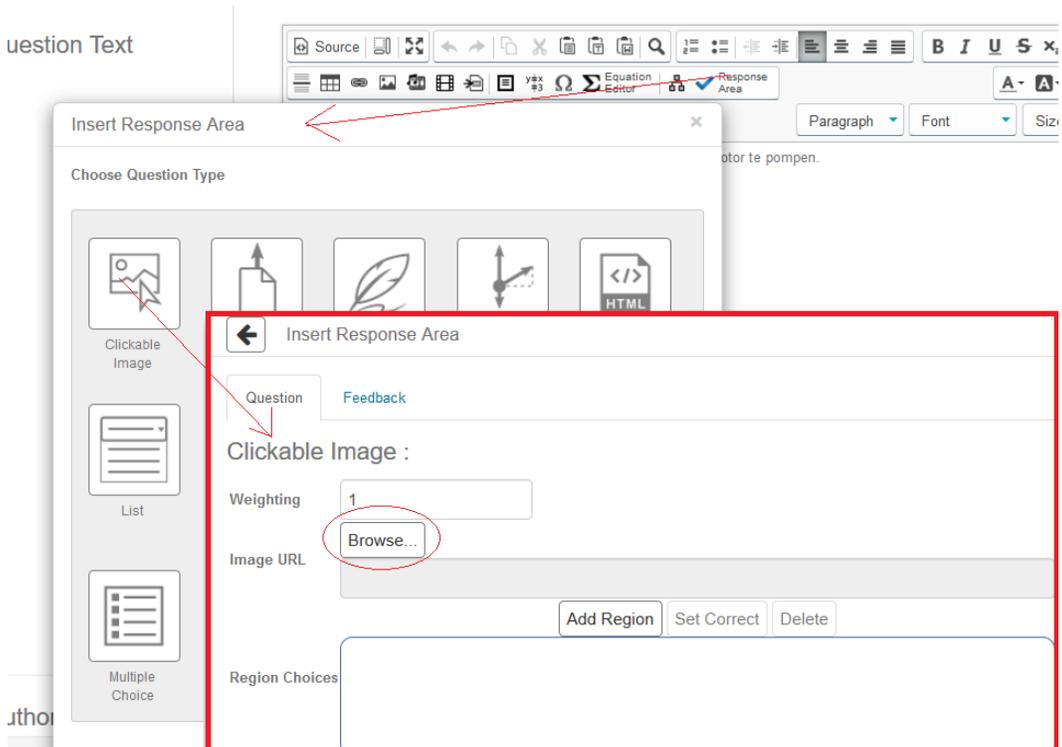


Figure 1.86: Creating the clickable image answer field

Clicking on *Browse* will take you to the *File Manager* where you can look up an image. By double clicking on the image, the image enters.

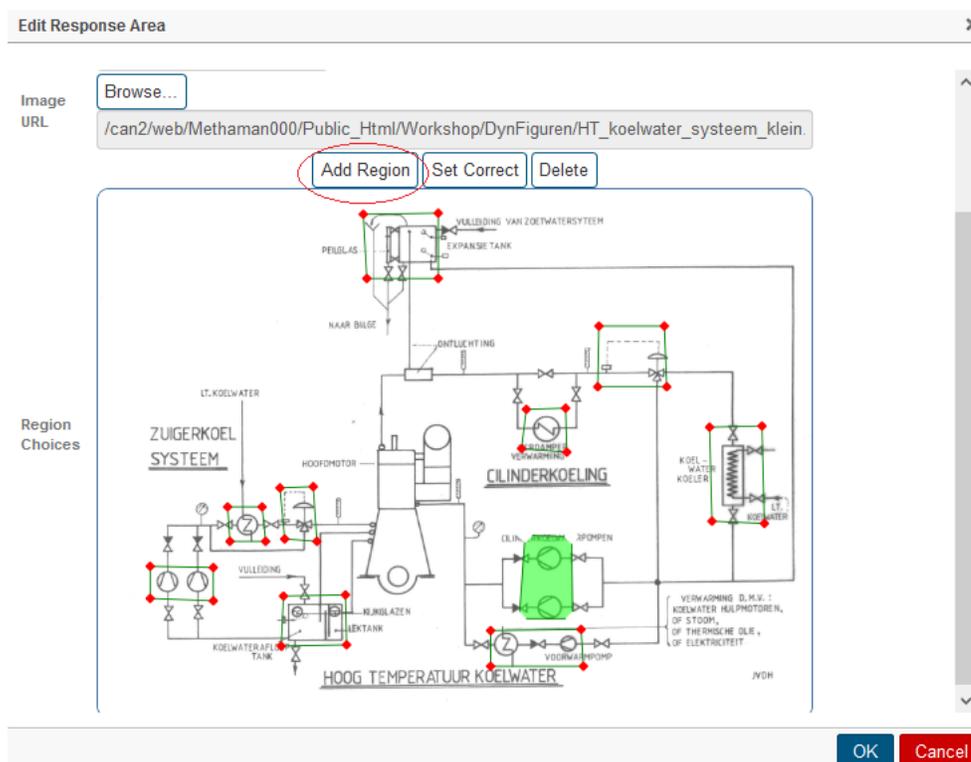


Figure 1.87: Defining areas in the image

With clicking *Add Region* you can use the mouse click with a number of red dots to frame an area. Create some of these areas by clicking *Add Region* over and over again.

Click on one of these areas. The red dots then disappear and the green lines remain. For this area, you can choose that it is the right area with *Set Correct*.

But you can also choose to remove this created area with *Delete*.

More areas as the correct mark or disappear is also possible by clicking more areas in succession where the red dots then disappear. The blue *OK* button confirms your choice.

1.9.5.1 Randomizing of the Clickable Image

You can randomize the question by asking a slightly different question each time where a different area belongs as a correct answer.

In this question, there are 10 areas defined by red dots. The 10 areas are numbered in the *Source Code*. If the correct answer is the area number 10, then it will stay that way. But you can also assign an algorithmic variable to the correct answer: the number of the correct area. In the algorithm section, create a variable that corresponds to the correct area number. For example, the variable \$a and save the Question with *Save & Close*. Then open the Question using *Edit -> Edit Source*.

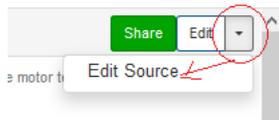


Figure 1.88: Edit Source

You will then enter the *Source Code* of the Question where you are looking for the answer line. There you indicate that the answer is not the original area number 10 but number \$a.

```

1 part.1.region.10=477,386,529,388,530,479,471,479@
2 weighting=1@
3 allowRepublish=false@
4 solution=@
5 part.1.numberOfAttempts=1@
6 appliedThemes=@
7 uid=d2f2199b-9d47-47a0-ba99-e5100a4610df@
8 numberOfAttemptsLeft=1@
9 mode=Inline@
10 difficulty=0.0@
11 numberOfTryAnother=@
12 part.1.width=@
13 part.1.height=@
14 name=Zoetwaterkoelschema gerandomiseerd@
15 part.1.gradingCode=@
16 description=@
17 part.1.region.9=203,334,241,332,244,393,208,390@
18 part.1.region.8=478,246,522,244,523,294,473,289@
19 customCss=@
20 part.1.region.7=559,153,633,153,635,221,558,220@
21 part.1.region.6=683,265,741,264,744,373,686,371@
22 part.1.question=@
23 part.1.modifiedIn=12.02@
24 part.1.region.5=438,493,539,491,542,533,439,532@
25 part.1.numberOfAttemptsLeft=1@
26 part.1.region.4=207,454,276,453,278,509,204,510@
27 part.1.answer=$a@
28 part.1.region.3=58,421,129,422,129,459,58,457@
29 part.1.editing=useHTML@
30 part.1.region.2=145,354,184,354,187,393,147,393@
31 part.1.region.1=296,28,380,27,380,99,300,99@
32 part.1.numberOfTryAnotherLeft=@
33 numberOfTryAnotherLeft=@
34 part.1.attributeAuthor=false@
35 part.1.numberOfTryAnother=@
36 editing=useHTML@
37 comment=@
38 id=@
39 part.1.mode=Clickable Image@
40 algorithm=$a=range(1,10);@
41 school=4d371c02-0aef-47ff-a091-c676055f80fc@

```

Figure 1.89: Source code of the Question

Then close again with *Save & Close*.

1.9.6 Matching Response Area

Matching concepts or matching pictures with indications are quick to make. The figure shows how examples of measuring scales should be divided into the four different types.

Wat hoort bijelkaar?

-- v ordinale schaal	-- v ratioschaal
-- v intervallschaal	-- v nominale schaal

1. burgerlijke staat
2. bouwjaar
3. gebruik openbaar vervoer (n, soms, vaak)
4. leeftijd in jaren

--
 1
 2
 3
 4

Figure 1.90: Matching

With *Drop-Down* menu, the student can make the right choice for each concept and a corresponding example. You create this answer field by inserting a *Response Area* and choosing *Matching*.

The screenshot shows the software interface for creating a Matching question. The 'Insert Response Area' dialog is open, showing various question types. The 'Matching' option is selected and circled in red. The 'Edit Response Area' dialog is also open, showing the 'Matching' configuration. The 'Weighting' is set to 1. The table below shows the items and matches:

The item	Matches with	
Source ← → ↶ ↷ ✕ Equation Editor B I U x ₂ x ² intervallschaal	Source ← → ↶ ↷ ✕ Equation Editor B I U x ₂ x ² Sinterval	Delete
Source ← → ↶ ↷ ✕ Equation Editor B I U x ₂ x ² ordinale schaal	Source ← → ↶ ↷ ✕ Equation Editor B I U x ₂ x ² Sordinaal	Delete

Figure 1.91: Inserting Matching question type

In the *Algorithm* you prepared some variables: examples of a concept.

```
$interval=switch(rint(3),"tijdsaanduiding in uren","temperatuur in C","bouwjaar");
$ratio=switch(rint(4),"leeftijd in jaren","hoogte t.o.v. N.A.P.", "aantal
verkeersdoden per week","levensduur gloeilamp");
$nominaal=switch(rint(3),"burgelijke staat","merk auto","bezit van auto");
$ordinaal=switch(rint(2),"gebruik openbaar vervoer (zelden, soms,
vaak)","tevredenheid");
```

In this way, the question is always slightly different. The item is the type of measuring scale and *Matches* with is the matching example.

The program ensures that everything is always mixed up. You can add matches with *Add Match* and you can also delete a set with the red *Delete* button.

You will find a button at the bottom where you can organize the items into more or fewer columns. Two columns have been created here.

HINT: Unfortunately, the feedback for these types of answer fields is very poor and consists only of the correct order of the numbers.

Partial good order also gives subpoints in the grading score.

In the Feedback of the Question you make a table with the right combinations as in the figure.

Grade: 0.25

Wat hoort bijelkaar?

Your response	Correct response
1 4 2 3	2 1 4 3

✘ Grade: 0.25/1.0

✘ Total grade: $0.25 \times 1/1 = 25\%$

Feedback:

De juiste combinaties zijn als volgt

intervalschaal	bouwjaar
ratioschaal	leeftijd in jaren
nominale schaal	burgelijke staat
ordinale schaal	tevredenheid

Figure 1.92: Feedback of the Matching question type

HINT: The number of items and associated matches must be exactly the same.

In other ways, you can also create matching questions yourself. See the manual *Randomization*.

1.9.7 Sorting Response Area

Placing images, text or formulas in the right order is done with the question type *Sorting*. With the mouse, the student drags the parts to the correct order.

Op de afbeeldingen zie je civiele objecten met een karakteristieke architectuur.

Aan de architectuur, maar soms ook aan de gebruikte techniek kun je aflezen wanneer deze objecten gebouwd zijn.

Plaats de getoonde objecten in chronologische volgorde. Links de oudste en rechts de nieuwste.



Figure 1.93: Sorting question type

You insert a *Response Area* with the button of the check mark and you choose *Sorting*.

The screenshot shows the Möbius software interface. At the top, there is a navigation bar with 'Möbius' and several menu items. Below that, the 'Question Text' editor is visible, containing the text from Figure 1.93. A toolbar with various icons is shown, including a 'Response Area' button. Below the editor, there is a 'Sorting' button. The bottom part of the screenshot shows the 'Edit Response Area' dialog. On the left, there are tabs for 'Question' and 'Feedback'. Below that, there is a 'Sorting:' label and a 'Weighting' field set to '1'. A list of 'Sortable Item (in order)' is shown, with two items: a bridge and a building. On the right, there is a 'Choose Question Type' panel with various icons, including 'Essay', 'Free Body Diagram', 'HTML', 'Matching', 'Math App', 'Mathematical Formula', 'Sketch', 'Sorting', and 'True/False'. The 'Sorting' icon is circled in red.

Figure 1.94: Inserting an answer field question type sorting

The correct order is that you fill in under each other. The system always mixes up the order for the student. This question type is easy to create. Formulas, images and texts can easily be entered into the items with lay-out buttons. At the bottom, you can adjust the width and height of the items. You can also set the background color of the frame as desired. The feedback indicates the correct order and also the order that the student had filled in.

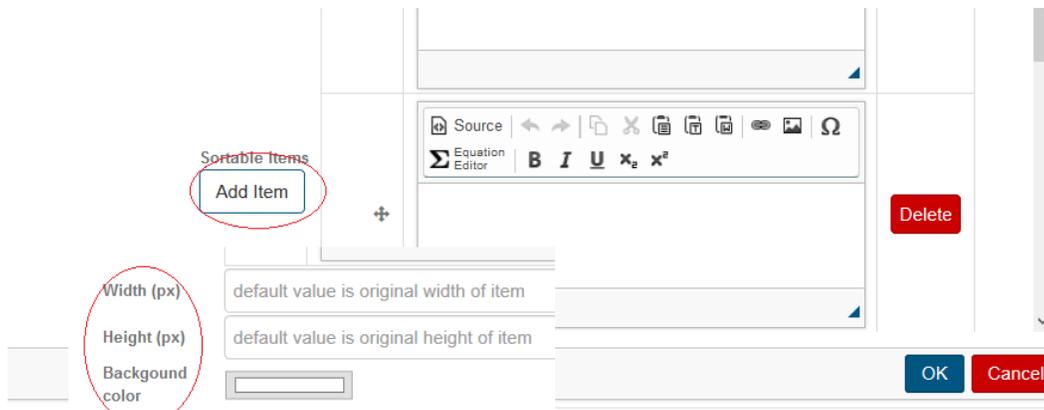


Figure 1.95: Changing lay out of the sorting answer field

1.9.8 Maple-graded Response Area

See Möbius Making test items part B (with formulas).

1.9.9 Mathematical formula Response Area

See Möbius Making test items part B (with formulas).

1.9.10 Free Body Diagram Response Area

See Möbius Making test items part C.

1.9.11 Sketch Response Area

See Möbius Making test items part C.

1.9.12 Math App Response Area

See Möbius Making test items part C.

1.10 Adaptive Question Designer

You can make adaptive each (existing) Question and use it in various ways.

- A) For example, it is possible to ask a complex Question. If the student does not answer this complex Question correctly, the student can then answer the Question step-by-step for which you give points for each step, but that the total score will be lower than if the Question was answered correctly by the student the first time.
- B) It is possible to make settings that only the points are awarded to the entire Question if all sub-questions have been answered correctly.
- C) If a question is asked, more than one attempt may be offered with any points deducted for each attempt.
- D) If the question is answered incorrectly or partially incorrectly, the question can be presented again with an explanation but with deduction of points.

Building such a Question requires a substantive didactic insight.

Here we give a few examples of possible constructions to create an adaptive Question with explanations about the different possibilities.

HINT: When administering a test with such a Question in it, the student will already receive assessments during the administration. Note that the adaptive is lost if you also offer a print version of the test, because then all parts can be viewed at the same time.

HINT: If you have already completed a Question with more answer fields and you want to make it an adaptive Question afterwards, you can easily do this by adding adaptive sections. In the following you see what is meant by an "adaptive section".

1.10.1 General

Ask a complex question first.



Figure 1.96: Adaptive question start

And offers the student a number of attempts. If it is answered correctly, the Question is finished and if not, the student is given intermediate questions.

Start a new Question

There is an extra button with which you can add section bars (*Adaptive Section*) between the different answer fields within the Question *Figure 1.97* (page 76).

These section bars separate the Question into several parts (sections).

You can divide a Question into more sections by including more of these section bars in one Question.

Each section in the design is closed off by such a section bar. A Question therefore ends with a closing section bar.

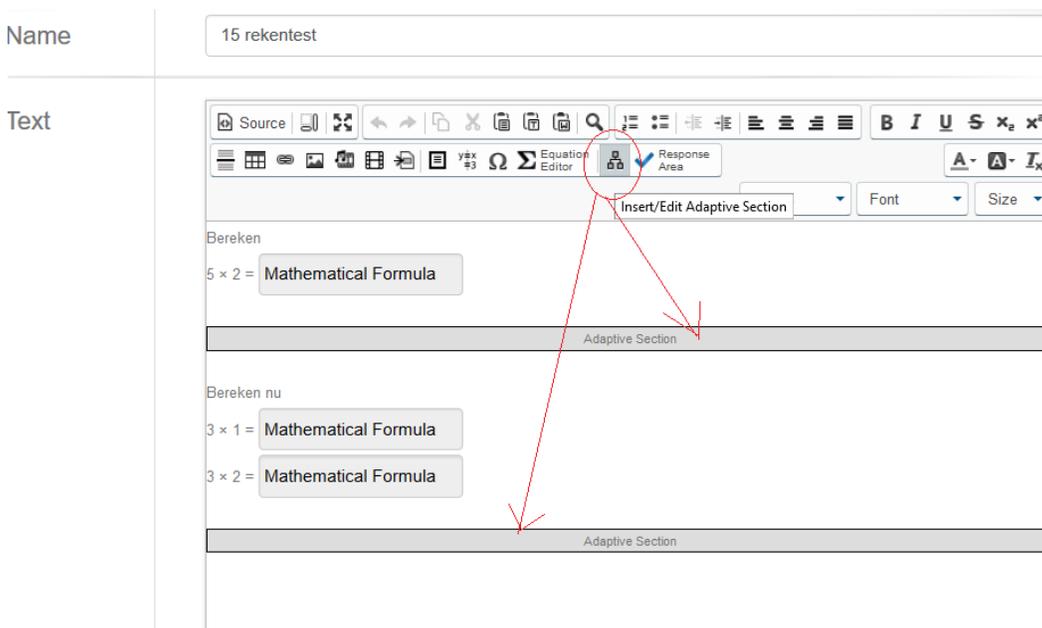


Figure 1.97: Creating the adaptive question

TIP: Make sure you place the section bar (with the *Insert/Edit Adaptive Section* button) outside everything, so never inside a table or the like.

Clicking on the *Adaptive Section* icon will bring up the following dialog: *Figure 1.98* (page 77) in which you can make various settings related to the previous section with answer fields.

Section	Correct	Incorrect
Attempts: <input type="text" value="4"/>	Weight: <input type="text" value="1.0"/>	Weight: <input type="text" value="0.0"/>
Allow Skip: <input checked="" type="checkbox"/>	Show Answer: <input checked="" type="checkbox"/>	Show Answer: <input checked="" type="checkbox"/>
Passing Score: <input type="text" value="1.0"/>	Display: <input checked="" type="checkbox"/>	Display: <input checked="" type="checkbox"/>
Penalty: <input type="text" value="0.1"/>	Question Complete: <input checked="" type="checkbox"/>	Question Complete: <input type="checkbox"/>

Figure 1.98: Settings for one Adaptive Section

In this dialog you can see that 4 attempts are made for the question asked in the previous section (Attempts = 4). The question then looks like as follows for the student if it occurs in an Assignment *Figure 1.99* (page 77).

Figure 1.99: Student sees the buttons of an adaptive question

It means that the student can answer the question and click the *Verify* button. With that, the answer is graded on *Correct* or *Incorrect* and then a new try is offered if it was below a certain *Passing Score*.

Figure 1.100: Student sees the buttons of an adaptive question after one attempt

- With each new attempt by the student, an **absolute** 0.1 point (10%) will be deducted from the total score that can be obtained **for the entire Question** (*Penalty* = 0.1). However, you must communicate this with the student in the question, because automatically the penalty is not mentioned, only in the feedback afterwards (in the *Gradebook*).
- By checking the checkbox next to *Allow Skip*, the student can decide not to try and skip the question when taking the test; a *Next Part* button will then be presented. If you give more than one attempt, the student should always click the *Verify* button to continue.
- By setting the *Passing Score*, the decision *Correct/Incorrect* can be set. This is only important if there is more than one answer field in the section. You can then get partial scores and set the *Passing Score* to 50%, for example.
- The figure also shows that if the decision is that the question has been answered correctly (as a result of the *Passing Score*), then the student will be awarded the full 100% for this question. This is set with *Correct: Weight* = 1. It is therefore possible that within an Assignment this Question is worth 5 points, and then the student will receive the full 5 points. However, if he only gives the correct answer after 2 wrong attempts (which are lower than the *Passing Score*), then he gets a deduction of 2 times 10%, so that is 20% deduction.
- Furthermore, this Question is totally completed after correctly answering this section and that is set with the checkbox at *Question Complete*.
The calculation for the grading is then shown: Total grade: $1.0 \times 1.0 - (2 \times 0.1) = 0.80$.

Figure 1.101: The student sees the result of the adaptive question after grading

This means that the student has answered the Question completely correctly and is awarded 1 point, but because two attempts have been lost, he is deducted 2 times 0.1, so in total the score for the entire Question is 80%.

If the Question in the Assignment was worth 5 points, then the student in this situation will receive a score of 4 points for this Question.

- Furthermore, the setting of the figure for the situation that the student answers the question incorrectly, that no point is awarded to this section: *Weight* = 0 and further, the checkbox at *Question Complete* is not checked, so that the student is automatically led to the next section. In that case, the student has not yet scored a single point and can possibly still score some points for sub-questions in the second section.
- The checkboxes *Show Answer* and *Display* are checked. The meaning is that after verifying, the student will see the correct answer and also the full text of the question.
- If the student decides in the meantime to go to *Next Part* and thus give up the attempts, he will see the following (where the student is asked: are you sure...).



Figure 1.102: The student gives up the attempts by clicking on the Next Part button

1.10.2 Complex question followed by sub-questions design phase

It would be a great pity if, when presenting a complex question, the student would score nothing at all if the answer was wrong.

With this *Adaptive Question* type it is now possible indeed to not award any points for the first part for incorrect answers, but to offer the possibility to continue answering sub-questions with which the student can still score something to show that he can do something.

We achieve this with the setting in the following figure by not checking the checkbox at *Question Complete* in the *Incorrect* column, which means that during the test the second section opens to the student with a new question.

The results of the previous section are fixed and can be made visible (or not) in case of *Correct* or *Incorrect* using the checkboxes at *Show Answer* and *Display*. The student cannot go back, but will get a next question and closed by such an *Adaptive Section* bar, as in the design phase in the following figure *Figure 1.103* (page 79).

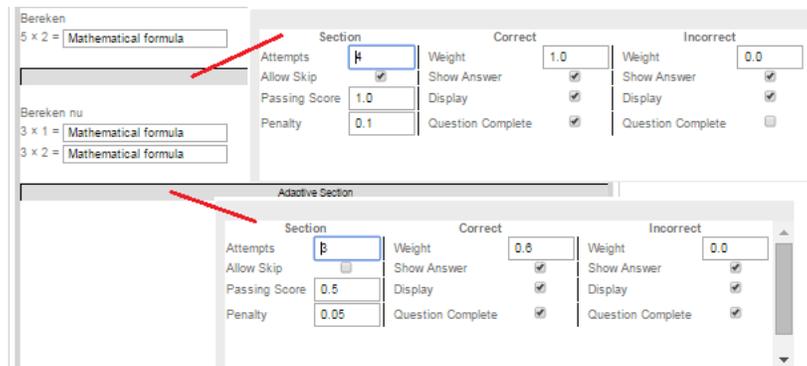


Figure 1.103: Two sections

There are now two sections in the question design. The first section contains one question for which the student gets 4 attempts and if after those 4 attempts it is still not the correct answer, the student gets 0 points (Weight = 0 if Incorrect) and therefore the Question is not yet completed (*Question Complete* unchecked), but the student is then redirected to the second section with in this case 2 answer fields.

The settings of this second *Adaptive Section* are now as follows:

- 3 attempts are now offered (*Attempts* = 3) and with the checkbox unchecked at *Allow Skip*, the student is not offered a button to skip this question.
- A *Passing Score* of 0.5 has been given here, which means that if the student gets half (or more) of the score for this section, then the answer is considered Correct and no more attempts

are offered. The Question is then completed (the *Question Complete* checkbox is checked at *Correct*).

- *Weight* = 0.6 has been entered at the *Correct* column. It is somewhat misleading, but it means that the student can then receive a maximum of 0.6 points for this section (consisting of two questions) depending on the grading. Suppose the student answers both questions of this second section correctly, then he will receive 0.6 points for this, possibly minus points for the number of previous attempts with incorrect results (*Penalty* = 0.05).
- Suppose the student has answered one of the two questions of this section correctly and one incorrectly (assuming that both answer fields have equal weight), then this section is graded as *Correct* based on the *Passing Score* (= 0.5) and then the Question has been completed and the student receives a score of $0.5 \times 0.6 = 0.3$ point, possibly minus the number of points for more attempts (*Penalty* = 0.05).
- If the score of this section is less than the *Passing Score* = 0.5 (i.e. both of these fields are filled in incorrectly), the student will not receive a single point (*Weight* = 0 if *Incorrect*) for this section. Less than 0 points is not allowed.
- You can also assign a number of points to the *Weight at Incorrect* column so that in the event that he scores less than 50%, the student may receive partial points of what he has scored. That doesn't make much sense in this situation because there were only two questions that can only be right or wrong and with a *Passing Score* of 0.5 that means if both questions are wrong, there are no points left. However, for certain questions where partial scores can still be obtained, you can still give points for the *Incorrect* situatio. See also section (*page 82*)

After answering this second section, the Question as a whole is completed. After all, with *Incorrect* and with *Correct* the checkboxes of *Question Complete* are checked.

HINT: Check each time whether you choose to provide the correct answer (*Show Answer* checkbox) or not after the student has clicked on verify.

1.10.3 Complex question followed by sub-questions in a test

We are now going to answer the question from the previous section in its entirety as a student: Below is the calculation of the grade if the student has answered the first section completely wrong in all 4 attempts. A penalty of 0 is then deducted and that remains 0. Then the student first makes 2 wrong attempts at the second section and then he answers this section correctly. For this he gets a 0.6 rating minus two times 0.05 penalty. So that comes down to a total of $0.00 \times 0.0 - (3 \times 0.1) + 1.00 \times 0.6 - (2 \times 0.05) = 0.00 + 0.50$ so 50% rating.

15 rekestest

Grade: 0.5

Show all attempts

Your response	Correct response
Bereken $5 \times 2 =$ 3 4 5 6	Bereken $5 \times 2 = 10$
$0.0 \times 1/1 + 0.0 \times 1/1 + 0.0 \times 1/1 + 0.0 \times 1/1 = 0.00$	
Bereken nu $3 \times 1 =$ 4 5 6 $3 \times 2 =$ 5 7 6	
$0.0 \times 1/2 + 0.0 \times 1/2 + 1.0 \times 1/2 + 0.0 \times 1/2 + 0.0 \times 1/2 + 1.0 \times 1/2 = 1.00$	
Bereken nu $3 \times 1 = 3$ $3 \times 2 = 6$ 3	
$0.0 \times 1/2 + 0.0 \times 1/2 + 1.0 \times 1/2 + 0.0 \times 1/2 + 0.0 \times 1/2 + 1.0 \times 1/2 = 1.00$	
Total grade: $0.00 \times 0.0 - (3 \times 0.1) + 1.00 \times 0.6 - (2 \times 0.05) = 0.00 + 0.50$	

Figure 1.104: Grading of the adaptive question with grade calculation

1.10.4 Grading sub-questions separately

Suppose that the following settings of the two *Adaptive Sections* have been made for this same Question.

The screenshot shows the configuration for two adaptive sections. The first section is set for 4 attempts, a passing score of 1.0, and a weight of 0.7 for correct answers. The second section is set for 6 attempts, a passing score of 0.5, and a weight of 0.3 for correct answers. Both sections have 'Question Complete' checkboxes unchecked, indicating they must be completed by the student.

Figure 1.105: Two adaptive sections

The two sections must in this case both be completed by the student. After all, the first section of both *Incorrect* and *Correct* has the *Question Complete* checkbox unchecked. Optionally, more sections can be added, each time closed with a section bar.

HINT: Pay attention to the number of points for *Weight* if the sub-questions are correct (depending on the *Passing Score*). After all, if the student has to go through all sections, then the total number of points of the weights must be 1 if everything is answered correctly, otherwise the total grading of the Question could come to more than 100%.

Because in both cases (*Correct* and *Incorrect*) the first section automatically merges into the second section (*Question Complete* is unchecked in both cases), the student is guided through both sections anyway. At the end of the last section, *Question Complete* is checked both times. If the student is going to do this question and completes the third attempt correctly for the first section, the student is now guided to the next section. There in the second section the student has

already reached the *Passing Score* (= 0.5) on the second attempt by correctly filling in one of the two fields (of equal weight).

The calculation of the total score for the Question as a whole is then as follows:

First section: $1 \times 0.7 - (2 \times 0.1)$ that means the first one is completely correct but only counts for 70% (after all, **Weight**=0.7) and there is a deduction of 2 times 0.1 points for the two wrong attempts.

Second section: $0.5 \times 0.3 - (1 \times 0.05)$ half correct but only counts for 30% (after all, *Weight* = 0.3) and there is a deduction of 1 times 0.05 point for the first wrong attempt.

So in total 60% score *Figure 1.106* (page 82).

15 rekentest vervolg

Grade: 0.6

Show all attempts

Your response	Correct response
Bereken 5 x 2 = 3 4 10	Bereken 5 x 2 = 10
0.0x1/1 + 0.0x1/1 + 1.0x1/1 = 1.00	
Bereken nu 3 x 1 = 2 3 4 5	Bereken nu 3 x 1 = 3 3 x 2 = 6
0.0x1/2 + 1.0x1/2 + 0.0x1/2 + 0.0x1/2 = 0.50	
Total grade: $1.00 \times 0.7 - (2 \times 0.1) + 0.50 \times 0.3 - (1 \times 0.05) = 0.50 + 0.10$	

Figure 1.106: Grading of the question as a whole

HINT: So if the student has to go through all the sections, make sure that the total weight of all sections together is 100%.

1.10.5 Partial grading

You can imagine that a student gets, for example, three questions and then if everything is filled in correctly, he gets a 100% score. However, if only some of the questions are correct, he will not receive the proportional part of 100%, but of, for example, 80% or 60%.

You will see something similar in the settings of the following question:

Bereken de volgende vermenigvuldigingen

3 x 5 = Mathematical formula
4 x 5 = Mathematical formula
5 x 5 = Mathematical formula

Adaptive Section

Edit Adaptive Section

Section	Correct	Incorrect
Attempts	1	1
Allow Skip	<input type="checkbox"/>	<input type="checkbox"/>
Passing Score	1.0	0.6
Penalty	0.0	
Weight	1.0	0.6
Show Answer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Display	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Question Complete	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 1.107: Full grade if all correct otherwise partial grading

In the above manner it is possible to ask more questions and by setting the *Passing Score* = 1 you can force that the result is considered *Correct* if all fields are answered correctly. In that case, the grading is 100%.

However, if the student has answered at least one answer field incorrectly, the result will be seen as *Incorrect* and, for example, 60% can be divided over the correctly answered fields if you indicate this at *Incorrect* in the *Weight*.

Below you see the result of the grading if the student has two correct and one incorrect answer with the calculation of the points below. The result is now 40%, while all three correct would give 100%.

15a Rekenetest

Grade: 0.4

Show all attempts 

Your response	Correct response
Bereken de volgende vermenigvuldigingen	Bereken de volgende vermenigvuldigingen
<ul style="list-style-type: none">  $3 \times 5 = 15$  $4 \times 5 = 20$  $5 \times 5 = 24$ 	<ul style="list-style-type: none"> $3 \times 5 = 15$ $4 \times 5 = 20$ $5 \times 5 = 25$
$1.0 \times 1/3 + 1.0 \times 1/3 + 0.0 \times 1/3 = 0.67$	
Total grade: $0.67 \times 0.6 = 0.40$	

Figure 1.108: Calculation of the grading if not all correct

In conclusion, with this setting, 3 questions correct 100%, two questions correct 40% and 1 question correct 20%.

