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Supplementary material for the book

How to Write Technical and Scientific Reports

Understandable Structure, Good Design, Convincing Presentation

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**Learning and creating questions with
SN Flashcards or Brainyoo**

Contents

1.	Introduction to using SN Flashcards.....	3
2.	Learning with SN Flashcards.....	3
2.1	Learning sequentially	4
2.2	Learning in favorite mode	4
2.3	Learning in long-term memory mode	5
2.4	Learning in power mode	7
2.5	Learning in examination mode.....	9
2.6	Learning vocabulary	9
3.	Creating questions with SN Flashcards	10
3.1	Learning objectives.....	10
3.2	Question types	10
3.3	Preparations before creating questions.....	11
3.4	Creating questions in SN Flashcards or Brainyoo.....	12
3.4.1	Registration	12
3.4.2	Creating a new project	12
3.4.3	Creating flashcards	13
Opening the display of the project structure	13	
Entering open text questions (Text).....	15	
Entering multiple choice questions (Multiple Choice)	16	
Entering assignment questions (Zuordnen)	16	
Entering cloze text questions (Lückentext)	17	
Entering vocabulary questions (Vokabel).....	18	
3.4.5	Answering the questions in learning mode.....	18
Answering open text questions (Text)	18	
Answering multiple choice questions (Multiple Choice).....	19	
Answering assignment questions (Zuordnen).....	20	
Answering cloze text questions (Lückentext).....	21	
Answering vocabulary questions (Vokabel)	21	
4.	Sharing flashcards with the editor	22
5.	Information for the readers of the printed book	22
6.	Further information about Brainyoo.....	22
7.	Pre-produced flashcards from the Brainyoo community.....	23

1. Introduction to using SN Flashcards

The system SN Flashcards internally uses the software Brainyoo.

SN Flashcards or Brainyoo respectively is a learning software. It applies science-based learning with simple question and answer cards organized in micro-learning modules. The software is platform independent and you can include various feedback, hint and multimedia elements on the flashcards.

SN Flashcards is available as web version or app for Android and iOS. Moreover, Brainyoo is also available as desktop version for Windows or iOS.

- ▶ The web version or app for Android and iOS have a German interface. It is only in the desktop version for Windows or iOS, that you can select an English user interface. In this manual I have translated the German user dialogues to English, so that you understand what is meant.

If you use the software on several platforms, your created questions and given answers will synchronize, i. e. you will see the same data on all platforms.

To use the SN Flashcards Software with our learning cards, please follow these steps:

1. Visit the page <https://flashcards.springernature.com/login> and/or install the SN Flashcards App on your Android or iOS device (mobile phone or tablet).
2. Create a user account by entering your e-mail address and a password.
3. Use the following link to open your SN Flashcards (learning cards): `sn.pub/xxxxxx`. You will find the publication number xxxxxx in the front matter of the book or in the pdf file with the first chapter.

You can use the SN Flashcards software for creating your own learning cards and entering your own vocabulary lists.

2. Learning with SN Flashcards

In the software you will read and answer flashcards. The software registers your answers and administrates the flashcards in six compartments or boxes based on the learning method introduced by Sebastian Leitner.

Learners can apply different learning algorithms. They shall not only get to know the information, but also anchor it in their long-term memory, to recall it without mistakes e. g. in an examination.

I want to tell you something regarding the „Eselsbrücken“ (memory hooks) in advance. We did not give you information that facilitates the answers here, but we have hidden supplementary and background information here, because there seems to be no other way in the Brainyoo system to display additional information after the solution was shown. Therefore we recommend that the display of „Eselsbrücken“ (memory hooks) is switched off by default.

Web version: Home > Optionen > Lernoptionen > [] Eselsbrücke immer anzeigen
(*Home > Options > Learning options > [] Always show memory hooks*)

Android version: Home > Einstellungen > Eselsbrücke immer anzeigen > Deaktiviert
(*Home > Settings > Always show memory hook > Deactivated*)

2.1 Learning sequentially

If you want to learn the information in the correct logical order at first, you should recall it sequentially. To do that, please activate the examination mode as follows:

Web version: Home > Optionen > Prüfungsmodus
Lernreihenfolge [✓] Sequenziell [] Zufällig
(*Home > Options > Examination mode
Learning sequence [✓] Sequentially [] At random*)

Android version: Home > Einstellungen > Prüfungsmodus > Geordnet
(*Home > Settings > Examination mode > By order*)

We recommend, that you click on the provided memory hooks, after the system checked your answer and gave you feedback. If you do not want to click all the time, you can switch on the display of learning hooks by default.

Web version: Home > Optionen > Lernoptionen > [✓] Eselsbrücke immer anzeigen
(*Home > Options > Learning options > [✓] Always show memory hooks*)

Android version: Home > Einstellungen > Eselsbrücke immer anzeigen > Aktiviert
(*Home > Settings > Always show memory hook > Activated*)

2.2 Learning in favorite mode

If you want to selectively learn cards which are difficult to remember, you can mark the difficult flashcards as favorites and learn them in a concentrated way in favorite mode. To use this learning mode, you must have marked at least five flashcards as favorites. This is how to activate the favorite mode:

Android version: Home > Einstellungen > Langzeitgedächtnismodus

Kasten 1

1 Tag

Kasten 2

3 Tage

Kasten 3

10 Tage

Kasten 4

30 Tage

Kasten 5

50 Tage

Kasten 6

80 Tage

Karten pro Sitzung

Unbegrenzt

Anzahl der Karten

30 Karten

(Home > Settings > Long-term memory mode

Box 1

1 Day

Box 2

3 Days

Box 3

10 Days

Box 4

30 Days

Box 5

50 Days

Box 6

80 Days

Cards per session

Unlimited

Number of cards

30 Cards)

2.4 Learning in power mode

The power mode also uses the six box principle and is based on the assumption that the short-term memory can learn information comparatively fast. This mode is very flexible and can also be applied for an intensive short-term preparation of an examination. In this learning mode it is important that the learner will get the flashcards over and over in short intervals, until he/she has learned the information by heart. The probability of getting re-presented a flashcard from one of the subsequent boxes decreases quickly.

Flashcards that are easy to remember by the learner, will very soon be sorted into one of the subsequent boxes and thus will be re-presented more seldom by the system. However, flashcards that are difficult to remember by the learner will be re-presented often. The cards in box 1 which were not yet shown to the learner or which the user marked as unknown/wrong will be selected with a probability of 50 %, while cards that have been answered correctly five times will be selected with a probability of only 2 % (with default setting).

If the learner has to learn several hundreds of flashcards, all cards would start in box 1. The system would gradually present all cards by random. To give the learner a chance to remember flashcards which have been presented before, the system limits the number of cards in box 1 from which it selects the flashcards. The learner can change this activation buffer to any number. It is set to 30 by default. That means that in the beginning the learner will learn only 30 cards from box 1 very intensively. This is how to activate the power mode and to control the system behaviour:

Web version: Home > Optionen > Powermodus

Aktivierungspuffer für neue Karten: 30

Wahrscheinlichkeit der Karteikästen in %

= 50 --> 30 --> 10 --> 5 --> 3 --> 2

Kasten 1 Kasten 2 Kasten 3 Kasten 4 Kasten 5 Kasten 6

> Speichern

Home > Options > Power mode

Activation buffer for new cards: 30

Probability of boxes in %

= 50 --> 30 --> 10 --> 5 --> 3 --> 2

Box 1 Box 2 Box 3 Box 4 Box 5 Box 6

> Save

Android version: Home > Einstellungen > Powermodus

Kasten 1

50 %

Kasten 2

30 %

Kasten 3

10 %

Kasten 4

5 %

Kasten 5

2 %

Kasten 6

80 Tage

Karten pro Sitzung

Unbegrenzt [✓]

Aktivierungspuffer für neue Karten

30 Karten

Home > Settings > Power mode

Box 1

50 %

Box 2

30 %

Box 3

10 %

Box 4

5 %

Box 5

2 %

Box 6

80 Days

Cards per session

Unlimited [✓]

Activation buffer for new cards

30 Cards

2.5 Learning in examination mode

If you have successfully learned and want to simulate an examination now, you can do that with the flashcards being presented by random. The time you need is saved and so you can repeat the examination to become better and faster like in a computer game as often as you like it. This is how to activate the examination mode:

Web version: Home > Optionen > Prüfungsmodus
Lernreihenfolge [] Sequenziell [✓] Zufällig
*(Home > Options > Examination mode
Learning sequence [] Sequential [✓] By random)*

Android version: Home > Einstellungen > Prüfungsmodus > Reihenfolge: Zufällig
(Home > Settings > Examination mode > Sequence: By random)

2.6 Learning vocabulary

If you want to learn vocabulary, you can learn questions and answers in the defined learning direction at first, e. g. in the direction English-German. Later you can swap the learning direction e. g. to German-English. However, this swapping/asking vice versa is not recommended for learning our SN Flashcards! This is how to control the learning of vocabulary:

Web-Version: Home > Optionen > Lernoptionen > [] Fragen und Antworten vertauschen
oder
Home > Optionen > Lernoptionen > [✓] Fragen und Antworten vertauschen
*(Home > Options > Learning options > [] Swap questions and answers
or
Home > Options > Learning options > [✓] Swap questions and answers)*

Android-Version: Home > Einstellungen > Lernoptionen > Karten verdreht abfragen: Deaktiviert
or
Home > Einstellungen > Lernoptionen > Karten verdreht abfragen: Aktiviert
*(Home > Settings > Learning options > Ask flashcards vice versa: Deactivated
or
Home > Settings > Learning options > Ask flashcards vice versa: Activated)*

3. Creating questions with SN Flashcards

3.1 Learning objectives

Teachers (flashcard authors) should define learning objectives for the information that is to be learned with the following properties: **concrete, measurable, reachable, relevant, time-related**.

According to Bloom's taxonomy of learning objectives there are three categories of learning:

- cognitive (information and intellectual abilities),
- affective (interests, attitudes, and values) and
- psychomotoric (physic, manual, motoric, sensoric, or technical abilities).

The cognitive category is the most important for examinations in schools and universities.

It has been divided into six subcategories describing what the learners should do:

- Knowledge: recognize, remember, list, label, define, find
- Understanding: interpret, illustrate, explain, summarize, deduct, compare
- Application: make, implement, select, generalize
- Analysis: differentiate, classify, assign, distinguish
- Creation: develop, plan, produce, manufacture
- Evaluation: check, examine thoroughly, evaluate, compare

These verbs can be used in your tasks and questions!

The computer program (or app) shall check whether the learners fulfil their learning objectives.

To do that there are different question types known from other learning systems.

3.2 Question types

In the following I will show which question types are available in the software SN Flashcards or Brainyoo and which question types of other e-learning systems can be realized with them.

Please keep in mind that in SN Flashcards or Brainyoo you can give very complex feedback to the learner for each answering option and for the complete answer. The feedback may not only contain text, but also images, audio and video sequences.

Assignment of question types in other learning systems to SN Flashcards-/Brainyoo questions

Question types in SN Flashcards or Brainyoo →	Multiple Choice	Assignment	Gap	Text	Vocabulary
Question types in other learning systems ↓					
Yes-No question	X				
Multiple Choice (1 from n)	X				
Multiple Response (m from n)	X				
Hotspot questions		X			
Drag and drop		X			
Sorting/Grouping: e. g. categorizing vocabulary (animal/man/plant, present tense/past tense/present perfect)		X			
Order: Prioritizing tasks, evaluating elements or sorting them by order (from small to big, by time sequence etc.)		X			
Assignment: matching two elements (term/definition, physical value/unit)		X			
Placement: Positioning objects at a specified place (e. g. image with labels 1-5, assigning terms with numbers 1-5 in an image)		X			
Text with gaps			X		
Open question (with exemplary answer and correction/evaluation by the learner)				X	
Vocabulary with accompanying text					X

3.3 Preparations before creating questions

There is no spell checker in the editor. Therefore you should create the questions and answers in word or a comparable program and insert them with Ctrl-C and Ctrl-V into the SN Flashcards or Brainyoo system (inserting without formatting with Ctrl-Shift-V).

Please keep in mind:

- New objects will always be added at the top of the list. Therefore create the lessons and flashcards from back to front or bottom to top on each object level!
- Save each question (click the button at the lower right)!
- Questions which have not yet been saved are marked with "*" in front of the question text.

You can learn each question type with all program versions, i. e. with the web version, the desktop version for Windows and iOS and the Android-/iOS app.

But you cannot create each question type with each program version. The following table shows, which question type can be created with which program version.

Program version → Question types, which you can create in SN Flashcards or Brainyoo ↓	Web application	Desktop application (Windows/iOS)	Android-/iOS- App
Open text question	✓	✓	✓
Multiple Choice	✓	✓	✓
Assignment	✓	–	–
Text with gaps	✓	✓	–
Vocabulary	✓	–	–

3.4 Creating questions in SN Flashcards or Brainyoo

Now creating questions will be displayed within the web version. The procedure is similar in the desktop version (Windows, iOS) and the app (Android, iOS). Please follow the steps as described below.

3.4.1 Registration

Please get registered at flashcards.springernature.com or brainyoo.de.

3.4.2 Creating a new project

Your project is hierarchically structured. Please give appropriate names to the different levels. There is a folder at the very top and lessons with flashcards below. Please use the following structure when creating **SPRINGERNATURE Flashcards**.

Logical project structure

Folder = top level,

e. g. "Books"

New folder = lesson = special title and edition,

e. g. "How to Write Technical and Scientific Reports, 3rd ed."

(can be moved to other lessons or shared with other people)

Lessons = book chapters,

e. g. "Chapter 1+2"

(can be moved to other lessons or shared with other people)

Display of the project structure

The folder structure is displayed at the upper screen edge, e. g.

Start > Books > How to Write Technical and Scientific Reports, 3rd ed. > Chapter 1+2

Limitations:

- min. 50 flashcards per folder (whole book)
- min. 10 flashcards per lesson (chapter)

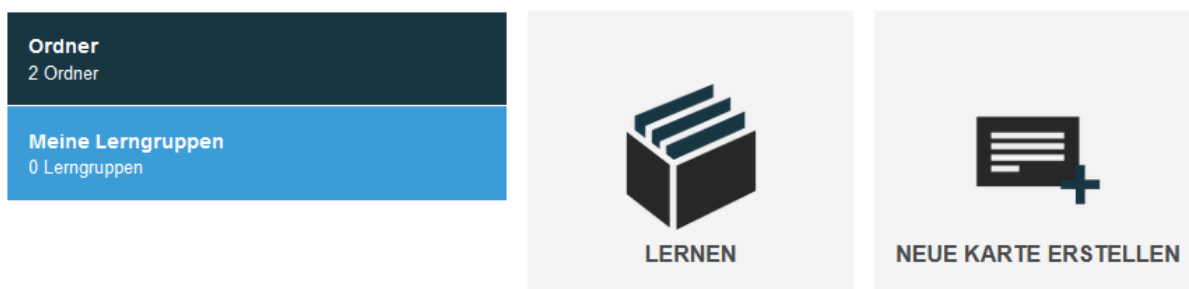
3.4.3 Creating flashcards

It is best to create flashcards in the web version, because it is only here that you can create all question types. In the desktop version (Windows, iOS) and the app (Android, iOS) you can create fewer question types, please refer to section 3.3 on page 11.

Opening the display of the project structure

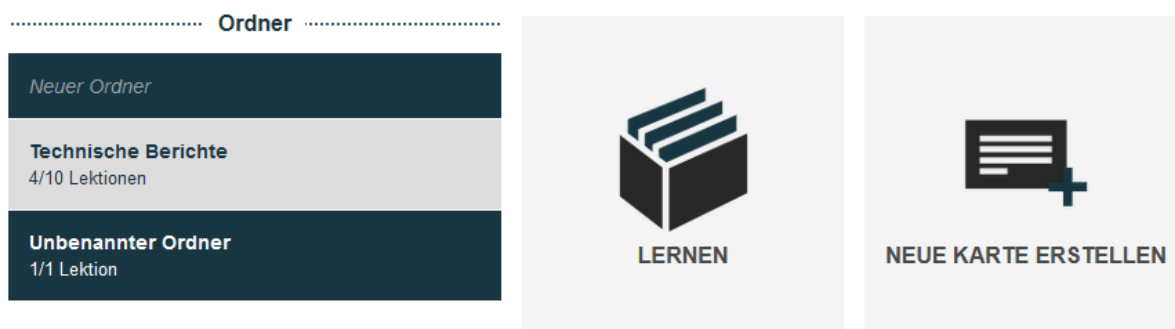
In the web version click on the logo **SPRINGER NATURE Flashcards** in the upper left corner and then on „Ordner“.

Start



On the left side you see your project structure. Click on Ordner.

Start > Ordner



If you move the mouse pointer to a folder name like Technische Berichte or Unbekannter Ordner, a context menu will be displayed offering you the following functions:

- Pencil: edit the name
- Arrow up, arrow down: move object in the tree structure
- Cross: delete object

Click on the folder, where you want to create questions, e. g. Unbekannter Ordner. Then click on the lesson and eventually sublesson.

If you want to create a new flashcard, either click on Neue Karte erstellen (Create new card) on the right side or on Alle Karten zeigen (Show all cards). The displayed button varies depending on where you are in the tree structure.

A list will appear showing all questions created so far. Please click on Neue Frage erstellen (Create new card) in the table headline. An empty question window will be opened. Please select the question type on the right side by clicking on the appropriate image at Meue Antwort (New answer).

	Neue Frage erstellen	Neue Antwort erstellen	Typ	Kasten
	<p>Neue Frage</p> <p>Neue Frage</p>	<p>Neue Antwort</p> <p>Text Multiple Choice Zuordnen Lückentext Vokabel</p>		

Entering open text questions (Text)

The screenshot shows the editor interface. The left field is active, displaying a rich text editor with a toolbar. The toolbar includes icons for image, video, audio, LaTeX, font settings, bold, italic, underline, list, link, and unlink. The right field is labeled "Neue Antwort". At the bottom left, there is a donkey head icon with a right arrow. At the bottom right, there is a "Speichern" button.

If you click on the left field, the editor is shown. Now you can enter the text of the question and/or insert an image, audio or video file or a Latex formula by means of the buttons in the upper left corner. You can use the other buttons for formatting the text. They are self-explanatory. If you click on the right field, the same editor is shown and you can enter a sample response.

The button for entering a memory hook (donkey head icon) is always, i. e. for all question types, on the left side below the question field. Click on the arrow right >.

The arrow right changes to an arrow down and another input field appears. After clicking on this new input field the same editor is shown and you can enter hints for answering the question or background information.



The button Speichern (Save) is always, i. e. for all question types, on the right side below the answer field. Click on the arrow right!



Here is an example of an open text question with entered question and answer text.

Frage	Antwort
Was ist Stöcken?	Teil des Stadtteils Herrenhausen-Stöcken von Hannover in Niedersachsen

 >  Speichern

Entering multiple choice questions (Multiple Choice)

Frage	Antwort
Neue Frage	<input checked="" type="checkbox"/> Neue Antwort  

 >  Speichern

The icon with the checked circle marks a right option.

If you click on the checked circle the icon changes to an open circle.

This marks a wrong option.

Using the green plus icon at the bottom you can create new options.


Using the red cross icon at the right you can delete options.

As before, on the left side below the question field you can enter a memory hook and on the right side below the answer field you can save the flashcard and its answer.

Entering assignment questions (Zuordnen)

    | L^AT_EX | Schriftart | 18 |  | **A** | **B** | *I* | U |  |  |  |  |  


Paris ist die Hauptstadt von .

Rom ist die Hauptstadt von .

Berlin ist die Hauptstadt von .

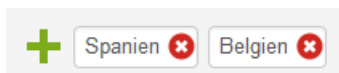


 >  Speichern

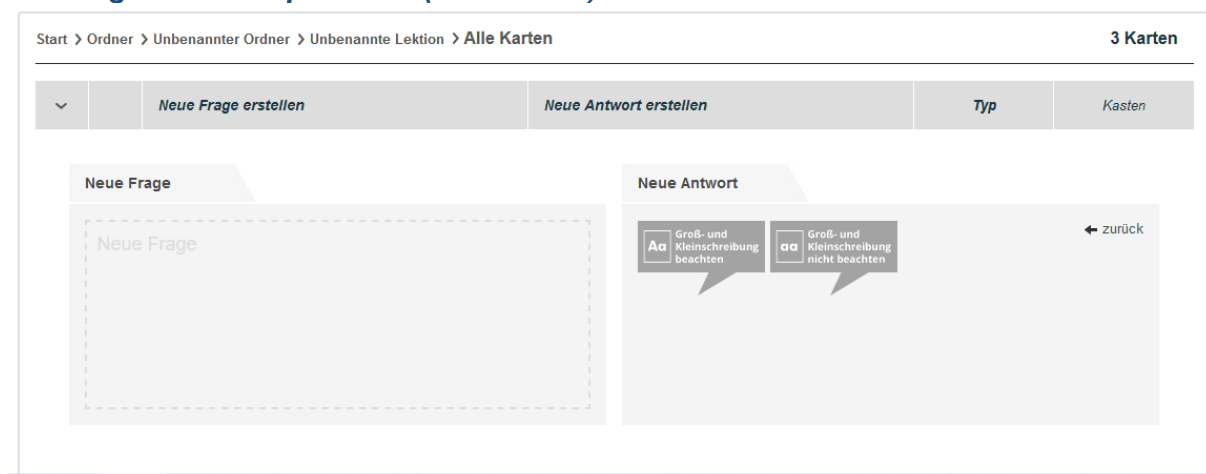
Now you can additionally enter text gaps in the editor: . This was used for the names of the countries in the example above.

Using the green plus icon at the bottom you can create new wrong options.

Using the red cross icon you can delete options.



Entering cloze text questions (Lückentext)

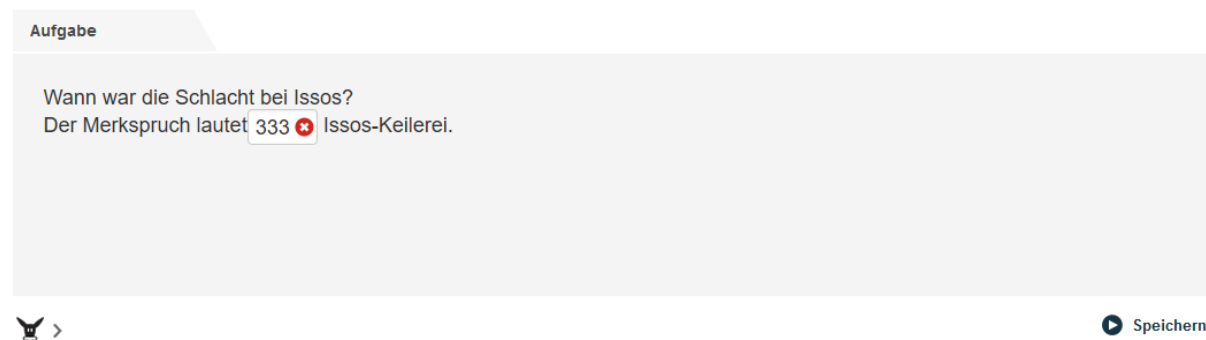


Please select whether to distinguish upper and lower case:

[Aa] Groß- und Kleinschreibung beachten (yes, distinguish) or

[aa] Groß- und Kleinschreibung nicht beachten (no, do not distinguish).

Now you can enter the text for the question or task and the text gaps.



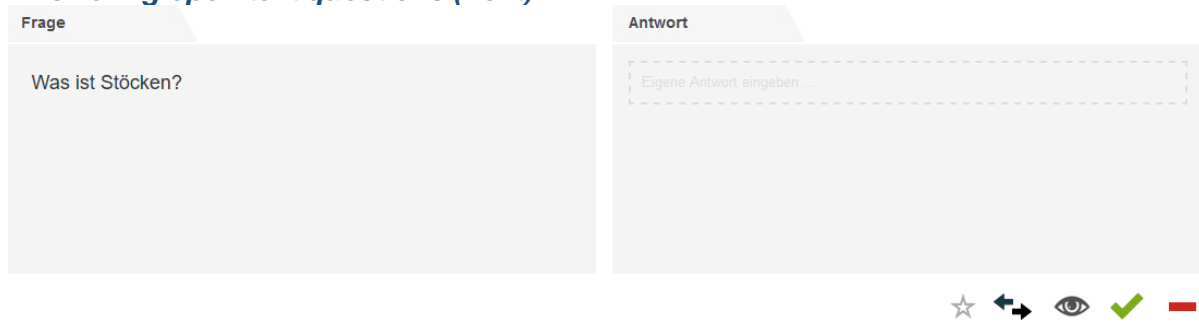
Entering vocabulary questions (Vokabel)



If you do not only want to enter a single word or phrase, but a complete sentence that contains the vocabulary, you have to mark the vocabulary, here house and Haus in the source and target language by using the function Auswahl als Vokabel markieren (mark selected text as vocabulary). Moreover, you can upload an image or an audio file. In the example above, an audio file was inserted.

3.4.5 Answering the questions in learning mode

Answering open text questions (Text)



The icons on the right side below the answer will initiate the following action:

- Star: mark question as favorite
- Arrows: swap question and answer
- Eye: show sample response
- Checked: rating my response as correct
- Minus: rating my response as wrong

If you did not enter a response, you can click on the eye to see a sample response.

Powermodus

Frage	Antwort
Was ist Stöcken?	Teil des Stadtteils Herrenhausen-Stöcken von Hannover in Niedersachsen Eigene Antwort eingeben ...

☆ ↔ 👁️ ✓ -

If you did enter a response, the system will first display the sample response and then your response.

Frage	Antwort
Was ist Stöcken?	Teil des Stadtteils Herrenhausen-Stöcken von Hannover in Niedersachsen Stadtteil von Hannover

☆ ↔ 👁️ ✓ -

Now you have to decide, whether your response shall be rated as correct (Checked icon) or wrong (Minus icon) and click on the appropriate icon.

Answering multiple choice questions (Multiple Choice)

Frage	Mögliche Antworten
Was müssen Radfahrer vor Antritt der Fahrt kontrollieren?	<input type="radio"/> Licht <input type="radio"/> Luftdruck <input type="radio"/> Bremsen <input type="radio"/> Sattel

After you have clicked on the circles belonging to the right options and on Zeige Antwort (Show answers) the following feedback will be displayed. You see your choice as checked circles and the right answers as green circles.

Frage

Was müssen Radfahrer vor Antritt der Fahrt kontrollieren?

Mögliche Antworten

Licht

Luftdruck

Bremsen

Sattel

Answering assignment questions (Zuordnen)

Aufgabe

Paris ist die Hauptstadt von .

Rom ist die Hauptstadt von .

Berlin ist die Hauptstadt von .

Frankreich Italien Deutschland Spanien Belgien

After you have selected the right answers (Frankreich=France, Italien=Italy and Deutschland=Germany), assigned the country names to the right text gaps and clicked on Zeige Antwort (Show answers) at the lower right, the system displays the following feedback, where correct answers will appear in green:

Aufgabe

Paris ist die Hauptstadt von **Frankreich**.

Rom ist die Hauptstadt von **Italien**.

Berlin ist die Hauptstadt von **Deutschland**.

Spanien Belgien Deutschland Italien Frankreich

☆ Nächste Karte

If you selected no option or a wrong option, this is marked in red:

Powermodus

Aufgabe

Paris ist die Hauptstadt von .

Rom ist die Hauptstadt von .

Berlin ist die Hauptstadt von

☆

Answering cloze text questions (Lückentext)

Here you have to enter the correct text into the text gaps without any predefined options.

Aufgabe

Wann war die Schlacht bei Issos?
Der Merkspruch lautet Issos-Keilerei.

The system will mark correct texts in green and wrong texts in red.

Answering vocabulary questions (Vokabel)

Powermodus

Frage

This is Mickey's .

Antwort

☆

After entering the answer and clicking on Zeige Antwort (Show answer) the following feedback will appear:

Powermodus

The screenshot shows a flashcard interface with two columns: 'Frage' (Question) and 'Antwort' (Answer). In the 'Frage' column, the text 'This is Mickey's house.' is displayed, with the word 'house' highlighted in a dashed box. In the 'Antwort' column, the text 'Dies ist Mickeys Haus.' is displayed, with 'Haus' highlighted in a dashed box. Below the answer, it says 'Richtige Antwort: Dies ist Mickeys Haus.' and 'Haus.' is highlighted in a dashed box. A play button icon is visible below the answer. At the bottom right, there are two buttons: 'Trotzdem richtig' (Nevertheless correct) and 'Nächste Karte' (Next card).

In this case the answer is rated as wrong, because the system expects to get the correctly written vocabulary in the target language only.

In this case, please click on **Trotzdem richtig!** (Nevertheless correct!)

4. Sharing flashcards with the editor

Please share the lesson and send the created link to your lector via e-mail.

After checking the flashcards a short URL will be created and published in the printed book, either in chapter 1 only or – upon request – in each chapter).

5. Information for the readers of the printed book

In the printed book the following text will be displayed:

Test your learning and check your understanding of this book's contents: use the "Springer Nature Flashcards" app to access questions.

To use the app, please follow the instructions below:

1. Go to <https://flashcards.springernature.com/login>
2. Create a user account by entering your e-mail address and assigning a password.
3. Use the following link to access your SN Flashcards set: `sn.pub/xxxxxx`

If the link is missing or does not work, please send an e-mail with the subject "SN Flashcards" and the book title to customerservice@springernature.com.

6. Further information about Brainyoo

The Brainyoo system is used and further developed in many schools, universities, and companies.

Here is a documentation of learning with Brainyoo:

<https://brainyoo.de/dokumentation/>

Here is a documentation of teaching and creating questions with Brainyoo:

<https://brainyoo.de/schule/lehrer-wiki/>

7. Pre-produced flashcards from the Brainyoo community

If you want to make use of pre-produced flashcards dealing with many different topics, you should think about installing the Brainyoo app or desktop version (Windows, iOS) in addition to installing the SN Flashcards app or register at <https://brainyoo.de/> in addition to registering at <https://flashcards.springernature.com>.

There are many flashcards available for little money in the Brainyoo online shop at <https://brainyoo.de/shop/>.