

The question type "MTF(ETH)" allows to create multiple-choice questions, i.e. questions where a multiple answers have to be selected. Each statement has to be evaluated separately. There are different scoring methods available (Subpoints: MTF1/0: Full points or zero points). The judgement options, e.g. "True"/"False" or "Yes"/"No", and the number of statements can be manually set.

We recommend question types "Kprime(ETH)" or "MTF(ETH)" over "Multiple choice" to create questions with a multiple-choice or multiple-true-false format. They have the advantage that each statement has to be explicitly evaluated and that no negative points have to be awarded for scoring. The questions types "Kprime(ETH)" or "MTF(ETH)" differ in the available judgement options and the amount of statements.

Open questions (e.g., essay questions) differ from closed questions (e.g., Multiple-Choice questions) in that the possible answers are "open", i.e. not predefined. What advantages and disadvantages do these formats have?

True	False	
<input type="radio"/>	<input type="radio"/>	Open questions allow evaluating derivations and intermediate steps
<input type="radio"/>	<input type="radio"/>	Closed questions allow for the error-free measurement of knowledge and competencies
<input type="radio"/>	<input type="radio"/>	Closed questions more easily allow the assessment of complex competencies (e.g., creation)
<input type="radio"/>	<input type="radio"/>	An advantage of closed questions is the objective and economical scoring
<input type="radio"/>	<input type="radio"/>	Closed questions often measure pure recognition and fact knowledge

Scoring method: **Subpoints**

Check

The question type "SC(ETH)" allows to create single-choice questions, i.e. questions where a single statement has to be selected. There is the possibility to cross out statements identified as wrong. Different scoring methods are available (1. SC1/0: Full points or zero points; 2. Aprim: Full points, half the points when crossing out all save one wrong statement, zero points; 3. Subpoints). We recommend this question type over the question type "Multiple choice" to create single-choice questions.

In «one-best-answers» Single-Choice questions the best statement must be selected. What is the main advantage of this format in comparison with questions with multiple correct statements?

<input type="radio"/>	The number of correct statements is known	<input type="checkbox"/>
<input type="radio"/>	The questions are easier to analyze	<input type="checkbox"/>
<input type="radio"/>	The questions are easier to construct	<input type="checkbox"/>
<input type="radio"/>	The statements do not have to be absolutely true or false	<input type="checkbox"/>
<input type="radio"/>	The correct statement is absolutely true	<input type="checkbox"/>

Scoring method: **SC1/0**

Check

The question type "Kprime(ETH)" allows to create multiple-choice questions with four statements that have to be judged. Each of the statements has to be evaluated separately. The default scoring method is "Kprime" (Full points, half the points for one error, zero points otherwise), but there are also other scoring methods available (Kprime1/0: Full points or zero points; Subpoints). The judgement options, e.g. "True"/"False" or "Yes"/"No", can be manually set.

We recommend the question types "Kprime(ETH)" or "MTF(ETH)" over "Multiple choice" to create questions with a multiple-choice or multiple-true-false format. They have the advantage that each statement has to be explicitly evaluated and that no negative points have to be awarded for scoring. The questions types "Kprime(ETH)" or "MTF(ETH)" differ in the available judgement options and the number of statements.

Which issues should be considered when constructing Single-/Multiple-Choice questions?

	True	False
The statements should be particularly long to test whether the students have really understood a topic	<input type="radio"/>	<input type="radio"/>
Negative points should be awarded for wrong statements in Multiple-Choice questions	<input type="radio"/>	<input type="radio"/>
The statements should not contain negations or nested sentences	<input type="radio"/>	<input type="radio"/>
Common misconceptions or outdated ideas are good candidates for distractors	<input type="radio"/>	<input type="radio"/>

Scoring method: **Kprime**

Check

# Moving away from the Moodle MC standard question type

SAMoo, 5 April 2020

# Standard MC Question Type and Fairness

**Question 1**

Not yet answered

Marked out of 1.00

Which metal is magnetic?



Select one or more:

- Cobalt
- Iron
- Nickel
- Gold
- Lead
- Copper

# Standard MC Question Type and Fairness

## Question 1

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Select one or more:

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Choice 3	<input type="checkbox"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Cobalt
Grade	33.33333%
Feedback	<input type="checkbox"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Choice 4	<input type="checkbox"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Copper
Grade	None
Feedback	<input type="checkbox"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Choice 5	<input type="checkbox"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Gold
Grade	None

Depending on the number of options: how to grade?

# Standard MC Question Type and Fairness

**Question 1**  
Not yet answered  
Marked out of 1.00

Which metal is magnetic?



Select one or more:

- Cobalt
- Iron
- Nickel
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- Lead
- Copper

<p>Choice 3</p> <p>Cobalt</p> <p>Grade: 33.33333%</p>	<p>Grade: 33.33333%</p>
<p>Feedback</p>	<p>Feedback</p>
<p>Choice 4</p> <p>Copper</p> <p>Grade: None</p>	<p>Grade: -33.33333%</p>
<p>Feedback</p>	<p>Feedback</p>
<p>Choice 5</p> <p>Gold</p> <p>Grade: None</p>	<p>Grade: -33.33333%</p>
<p>Feedback</p>	<p>Feedback</p>

Depending on the number of options: how to grade?


«none»? No

Negative grading: No

# Standard MC Question Type and Fairness

**Question 1**  
Not yet answered  
Marked out of 1.00

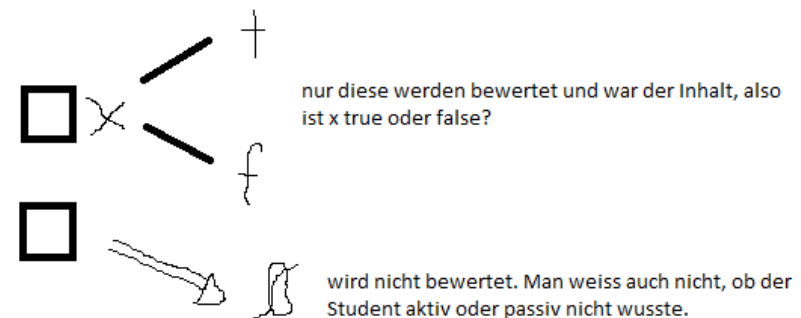
Which metal is magnetic?



Select one or more:

- Cobalt
- Iron
- Nickel
- Lead
- Gold
- Copper

A red question mark and a red arrow pointing to the Cobalt option are drawn on the image.



What do we know on the options that the student has not chosen?  
Is this option wrong?

# Multiple True False

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Scoring method: **Subpoints** ?

Check

There are two alternative scoring methods.

**Subpoints** (recommended): The student is awarded subpoints for each correct response.

**MTF1/0**: The student receives full points if all responses are correct, and zero points otherwise.

# Kprime

The question type "Kprime(ETH)" allows to create multiple-choice questions with four statements that have to be judged. Each of the statements has to be evaluated separately. The default scoring method is "Kprime" (Full points, half the points for one error, zero points otherwise), but there are also other scoring methods available (Kprime1/0: Full points or zero points; Subpoints). The judgement options, e.g. "True"/"False" or "Yes"/"No", can be manually set.

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	True	False
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Negative points should be awarded for wrong statements in Multiple-Choice questions	<input type="radio"/>	<input type="radio"/>
The statements should not contain negations or nested sentences	<input type="radio"/>	<input type="radio"/>
Common misconceptions or outdated ideas are good candidates for distractors	<input type="radio"/>	<input type="radio"/>

Scoring method: **Kprime** ?

Check

**Kprime:** The student receives full marks if all responses are correct, a 50% mark if all save one response are correct, and zero points otherwise.

**Kprime 1/0:** The student receives full marks if all responses are correct, and zero points otherwise.


**Subpoints:** The student is awarded subpoints for each correct response.

# Single Choice

The question type "SC(ETH)" allows to create single-choice questions, i.e. questions where a single statement has to be selected. There is the possibility to cross out statements identified as wrong. Different scoring methods are available (1. SC1/0: Full points or zero points; 2. Aprime: Full points, half the points when crossing out all save one wrong statement, zero points; 3. Subpoints). We recommend this question type over the question type "Multiple choice" to create single-choice questions.

In «one-best-answer» Single-Choice questions the best statement must be selected. What is the main advantage of this format in comparison with questions with multiple correct statements?

- The number of correct statements is known
- The questions are easier to analyze
- The questions are easier to construct
- The statements do not have to be absolutely true or false
- The correct statement is absolutely true

Scoring method: **SC1/0** 

Check

There are three alternative scoring methods:

**SC1/0** (recommended): The student receives full points if the only correct or best answer is identified, and zero points otherwise.

**Aprime**: The student receives full points for selecting the correct or best option, half of total points, if all distractors save one are crossed out, and zero points otherwise.

**Subpoints**: The student is awarded full points for selecting the correct or best option, subpoints for each correctly crossed out distractor up to half of total points for crossing out all save one distractor, and zero points otherwise.



# Migration scripts

**examples (disable dryrun needs to be added after course and category by "&dryrun=0")**

Migrate MTF Questions in a specific course:

MOODLE\_URL/question/type/mtf/bin/mig\_multichoice\_to\_mtf.php?courseid=55

Migrate MTF Questions in a specific category:

MOODLE\_URL/question/type/mtf/bin/mig\_multichoice\_to\_mtf.php?categoryid=1

Migrate all MTF Questions:

MOODLE\_URL/question/type/mtf/bin/mig\_multichoice\_to\_mtf.php?all=1

Disable Dryrun:

MOODLE\_URL/question/type/mtf/bin/mig\_multichoice\_to\_mtf.php?all=1&dryrun=0

Enable MigrateSingleAnswer:

MOODLE\_URL/question/type/mtf/bin/mig\_multichoice\_to\_mtf.php?all=1&dryrun=0&migrate  
singleanswer=1

# Download

MTF: [https://moodle.org/plugins/qtype\\_mtf](https://moodle.org/plugins/qtype_mtf)

Kprime: [https://moodle.org/plugins/qtype\\_kprime](https://moodle.org/plugins/qtype_kprime)

Single Choice: [https://github.com/ethz-let/moodle-qtype\\_sc](https://github.com/ethz-let/moodle-qtype_sc) (waiting for approval for <https://moodle.org/plugins> since spring 2019)

# Further reading

<https://blogs.ethz.ch/letblog/2019/12/18/how-to-multiple-choice-with-moodle/>