

LehrPuls Question Format (format version 1)

This document describes the file format used to import question collections into LehrPuls. It is meant to be uploaded to an AI service together with a source document (e.g. lecture notes as a PDF): the AI produces a file following this description, the user pastes the reply into LehrPuls in the "Topics & Questions" area in the "Create questions with AI" dialog (or saves it as a file with the extension `.json` and imports it via "Import (.lpx, .json)"). LehrPuls validates the file on import and reports violations with a clear error message; such a message can be given back to the AI for correction. Unknown extra fields outside `options_json` are silently ignored — all information must therefore live in the fields described here.

Instruction to the AI: Produce as your result exclusively the content of a single JSON file following this description — with no explanatory text before or after it. Stick exactly to the field names and rules given here and do not invent additional fields.

Basic structure

The file is a single JSON object. The fields `format` and `version` must read literally as shown, otherwise LehrPuls rejects the file:

```
{
  "format": "lehrpuls-export",
  "version": 1,
  "topics": [
    {
      "name": "Name of the topic",
      "questions": []
    }
  ]
}
```

After the import the questions appear under the given topic; a single topic is usually enough. Subtopics are possible by giving a topic a `children` field containing further topics of the same structure.

Fields of a question

Field	Required	Meaning
<code>qtype</code>	yes	question type, one of the values described below
<code>title</code>	yes	short, non-empty title for the question list
<code>body_md</code>	no	the actual question text (Markdown, see below)
<code>options_json</code>	yes	JSON object with the type-specific fields (see question types)
<code>solution_md</code>	no	solution note (Markdown), shown when the question is resolved
<code>difficulty</code>	no	difficulty, integer from 1 (easy) to 5 (hard)
<code>tags</code>	no	keywords, comma-separated in one string, e.g. "chapter 3, basics"
<code>time_budget_s</code>	no	planned working time in seconds, positive integer
<code>scenario</code>	no	key of a scenario defined in the file, usually from the same topic (see scenarios)

For `body_md` and `solution_md`: Markdown is allowed (lists, **bold**, code), mathematical formulas in KaTeX notation between `$...$` (inline) or `$$...$$` (own line). Every line break is rendered as a new line, a blank line separates paragraphs. No HTML — HTML tags are shown as literal text. **Do not reference images** — the file contains no image files, image references like `` end up empty after the import.

Within `options_json`, exactly the fields described per type are allowed; unknown fields cause the question to be rejected (and with it the whole file — the import is all or nothing). If a mandatory field is missing or has the wrong data type, the whole file is rejected with a technical message including the line number; `options_json` must therefore always be present, if necessary as `{}`.

The question types

mc_single — multiple choice with exactly one correct answer

```
{
  "choices": [
    { "id": "a", "text_md": "Answer A" },
    { "id": "b", "text_md": "Answer B" },
  ]
}
```

```
{ "id": "c", "text_md": "Answer C" }
],
"correct": ["b"]
}
```

At least two choices; the IDs are freely chosen strings (even "1" goes in quotes) but must be unique and non-empty, and the choice texts must not be empty either; `correct` contains exactly one of these IDs.

mc_multi — multiple choice with several correct answers

Same structure as `mc_single`; `correct` contains at least one ID, several are allowed.

poll — poll without a correct answer

Same structure as `mc_single`, but without grading: `correct` stays empty or is omitted. Participants pick exactly one option.

poll_multi — Poll+ with multiple selection

Like `poll`, but participants may check several options. `correct` stays empty as well.

open — free-text question

```
{ "max_len": 500 }
```

`max_len` is optional (default 500) and limits the answer length in characters (1 to 10000).

numeric — numeric value with tolerance

```
{ "answer": 42.0, "tolerance": 0.5, "unit": "m" }
```

An answer counts as correct if its distance to `answer` is at most `tolerance`. `answer` is mandatory. `tolerance` is optional (default 0 — the exact value) and must not be negative, `unit` is an optional unit for display.

estimate — estimation question without grading

```
{ "unit": "km", "reference": 384400 }
```

Both fields are optional; `reference` is the reference value shown when the question is resolved.

order — put elements into the correct order

```
{
  "items": [
    { "id": "1", "text_md": "Boil water" },
    { "id": "2", "text_md": "Grind coffee" },
    { "id": "3", "text_md": "Brew" }
  ],
  "correct_order": ["1", "2", "3"]
}
```

At least two items with unique, non-empty IDs and non-empty texts; `correct_order` contains exactly all IDs in the correct order.

matching — assign elements to categories

```
{
  "categories": [
    { "id": "k1", "text_md": "Mammal" },
    { "id": "k2", "text_md": "Bird" }
  ],
  "items": [
    { "id": "i1", "text_md": "Dolphin", "category": "k1" },
    { "id": "i2", "text_md": "Penguin", "category": "k2" }
  ]
}
```

At least two categories and two items, IDs unique and non-empty in each list, texts non-empty; `category` names the correct category of the item and is the grading.

info — announcement without a question

```
{ "ack": "ok" }
```

Shows the `body_md` as an announcement. `ack` is optional (default "ok") and controls the participants' acknowledgment: "none" (read only), "ok" (confirm with one button) or "yesno" (choose between two buttons); with "yesno", the optional fields `ack_yes` and `ack_no` label the two buttons, with "ok" only `ack_yes` may label the single button, with "none" both stay empty; `ack_no` is only allowed together with `ack_yes`, and a label has at most 40 characters. Optionally `url`

carries a link, which must start with `http://` or `https://` and must not contain spaces — or an email address as `mailto:name@university.example` (with `?subject=...` if desired).

The type `cloze` (gap text) is not intended for AI-generated files: gap texts use their own gap syntax inside the question text. Leave this type out.

Scenarios (optional)

A scenario is a shared case text that several questions refer to (e.g. a case description followed by questions). It is defined in the topic under `scenarios` (`key` and `title` are mandatory, `body_md` is optional; keys must be unique across the whole file) and referenced from questions via its key:

```
{
  "format": "lehrpuls-export",
  "version": 1,
  "topics": [
    {
      "name": "Case studies",
      "scenarios": [
        { "key": "s1", "title": "Case Miller", "body_md": "A 54-year-old patient presents with ..." }
      ],
      "questions": [
        { "qtype": "open", "title": "Initial diagnosis", "body_md": "What is your suspected diagnosis?", "options_json": { "max_len": 500 } }
      ]
    }
  ]
}
```

Complete example

```
{
  "format": "lehrpuls-export",
  "version": 1,
  "topics": [
    {
      "name": "Basics of photosynthesis",
      "questions": [
        {
          "qtype": "mc_single",
          "title": "Site of photosynthesis",
          "body_md": "In which cell organelle does photosynthesis take place?",
          "options_json": {
            "choices": [
              { "id": "a", "text_md": "Mitochondrion" },
              { "id": "b", "text_md": "Chloroplast" },
              { "id": "c", "text_md": "Nucleus" },
              { "id": "d", "text_md": "Ribosome" }
            ]
          },
          "correct": ["b"]
        },
        {
          "solution_md": "Photosynthesis takes place in the chloroplasts; that is where the chlorophyll is.",
          "difficulty": 2,
          "tags": "cell biology, basics",
          "time_budget_s": 60
        }
      ]
    },
    {
      "qtype": "mc_multi",
      "title": "Reactants of photosynthesis",
      "body_md": "Which substances are consumed during photosynthesis? (multiple answers)",
      "options_json": {
        "choices": [
          { "id": "a", "text_md": "Carbon dioxide" },
          { "id": "b", "text_md": "Oxygen" },
          { "id": "c", "text_md": "Water" },
          { "id": "d", "text_md": "Glucose" }
        ]
      },
      "correct": ["a", "c"]
    },
    {
      "solution_md": "$CO_2$ and water are consumed; oxygen and glucose are produced.",
      "difficulty": 3,
    }
  ]
}
```

```

    "tags": "metabolism",
    "time_budget_s": 90
  },
  {
    "qtype": "numeric",
    "title": "Wavelength of chlorophyll a",
    "body_md": "At which wavelength (in nm) is the absorption maximum of chlorophyll a in the red range?",
    "options_json": { "answer": 665, "tolerance": 10, "unit": "nm" },
    "solution_md": "The red absorption maximum is at about 665 nm.",
    "difficulty": 4,
    "tags": "photochemistry",
    "time_budget_s": 120
  },
  {
    "qtype": "open",
    "title": "Light-dependent reaction",
    "body_md": "Describe in two to three sentences what happens in the light-dependent reaction.",
    "options_json": { "max_len": 800 },
    "solution_md": "Light energy is used to split water; this produces ATP, NADPH and oxygen.",
    "difficulty": 3,
    "tags": "metabolism, transfer",
    "time_budget_s": 300
  }
]
}
}
}

```

Checklist before output

- The output is exactly one JSON file with no surrounding text.
- `format` is `"lehrpuls-export"`, `version` is `1`.
- Every question has `qtype`, `title` and an `options_json` matching its type — no additional fields.
- IDs within a question are unique; `correct` and `correct_order` follow the rules of the type.
- `difficulty` is between 1 and 5, `time_budget_s` is given in seconds.
- No image references.