

## Tool for assessing quality of learners' questions

### Advanced version

#### How can I benefit?

This tool can be useful for you if

- you have already used [the "Tool for assessing quality of learners' questions. Simple version"](#);
- you are familiar with the model of [stages of competence development](#);
- you intend to organise the learning process based on the stages of competence development model.

#### When can it be used?

The tool should be used at different stages of mastering a particular competence. It is assumed that learners' questions should change as they progress towards becoming more competent.

This tool can be used any time you ask your learners to formulate questions. It will be easier for you to assess questions if they are written down. You can use the tool either for assessing an individual student or the whole group.

In both cases, the tool will help you capture learners' progress in asking questions and see where support is needed.

#### How can I use it?

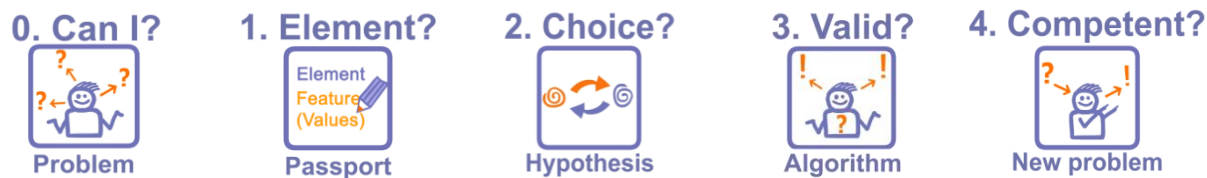
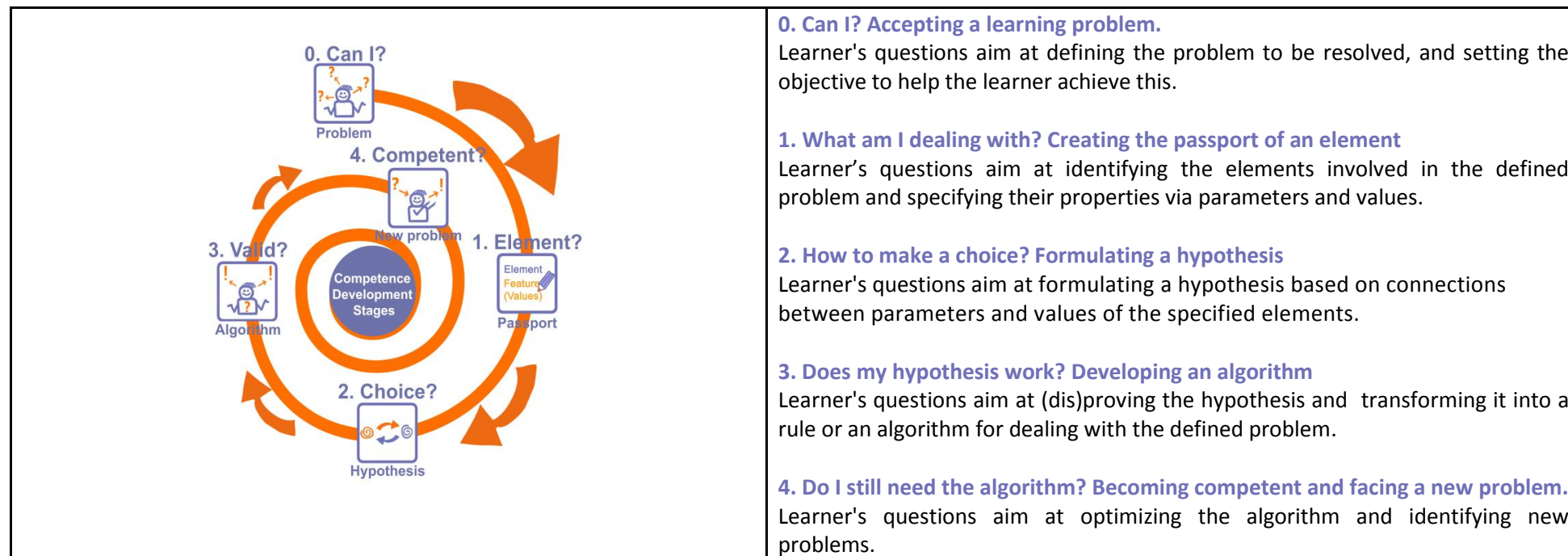
The use of the tool is similar to the application of a simple version of assessing quality of learners' questions. It is based on the same three evaluation parameters: problem-centredness, disposition and independence. As the indicators for the parameters differ at various phases of competence development, make sure you have selected the assessment sheet for the corresponding competence development stage.

Prior to assessing individual learners, you might want to get acquainted with all the proposed questions and decide on the best and poorest ones.

Taking notes of how learners are working will help you assess their disposition and independence.

## Stages of competence development

Learners' questions depend on the stage of competence development the learner is working on. Formative assessment should help the learner move towards the next stage. This is the general path to follow for the teacher and the learner.



## 0. Can I?



Problem

### Evaluation parameters

#### Learner's Questions at Competence Development Stage 0. Towards definition of a problem

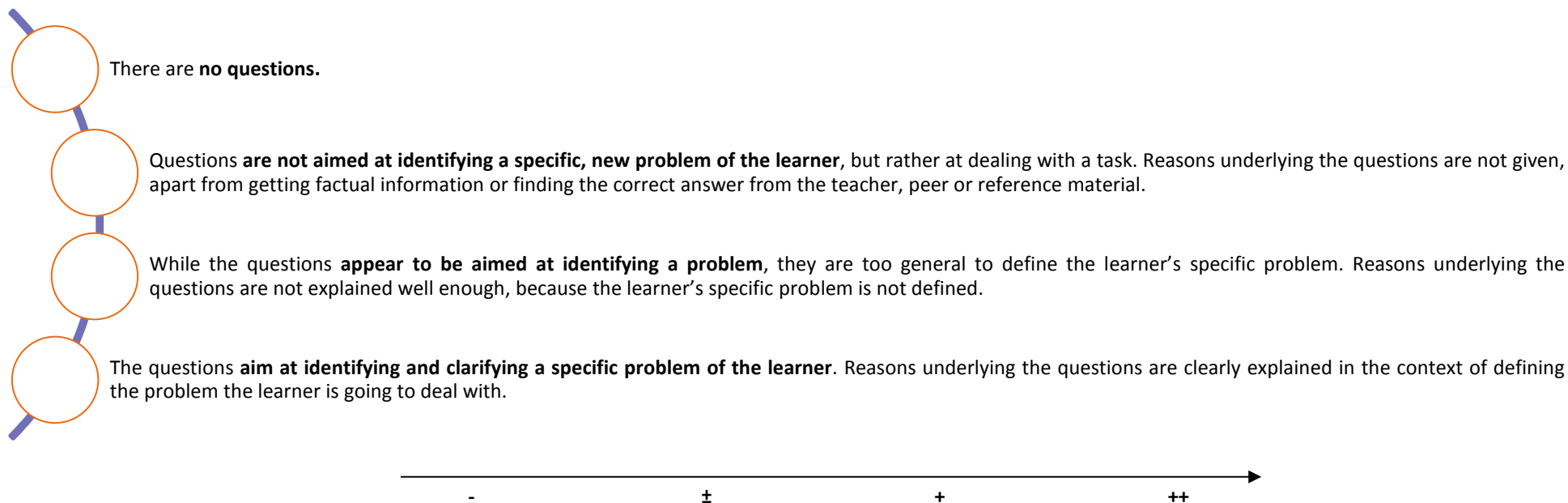
##### Important remark

The questions are formulated at Stage 0 as a response to a problem situation. They may have a very general character and may not be explicitly connected with the learner's difficulty because the problem at this stage might be too vague for the learner. The competent learner is, however, able to move from asking general questions to asking personal and specific ones.

A well-formulated specific question allows the learner to move towards:

- showing what (s)he would like to achieve (desired result);
- focusing on specific difficulties by giving examples of own mistakes (obstacles);
- explaining how the mistakes prevent from achieving the result;
- defining the objective for further work at Stage 1.

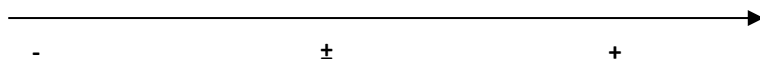
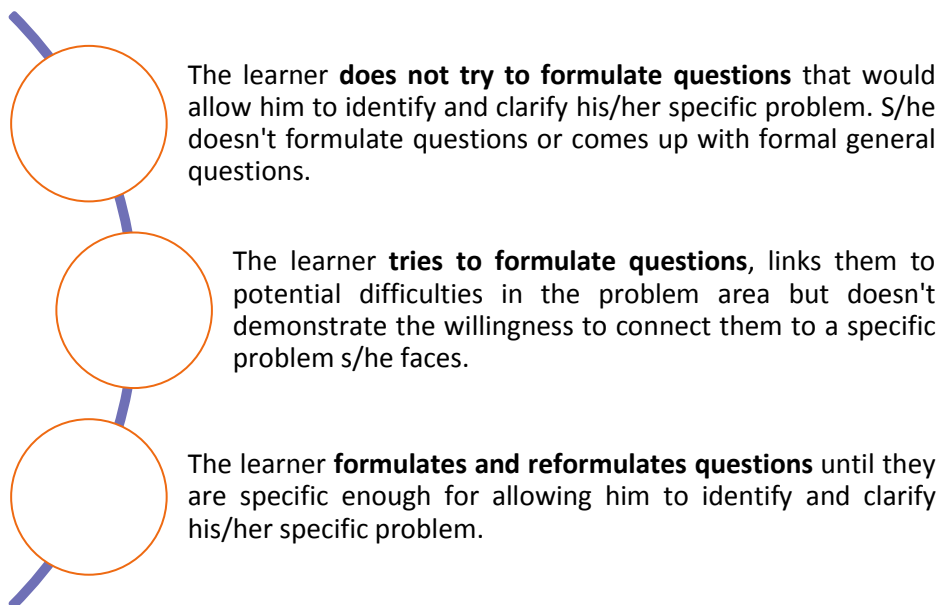
#### PROBLEM-CENTREDNESS OF THE OBJECTIVE



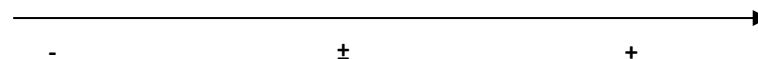
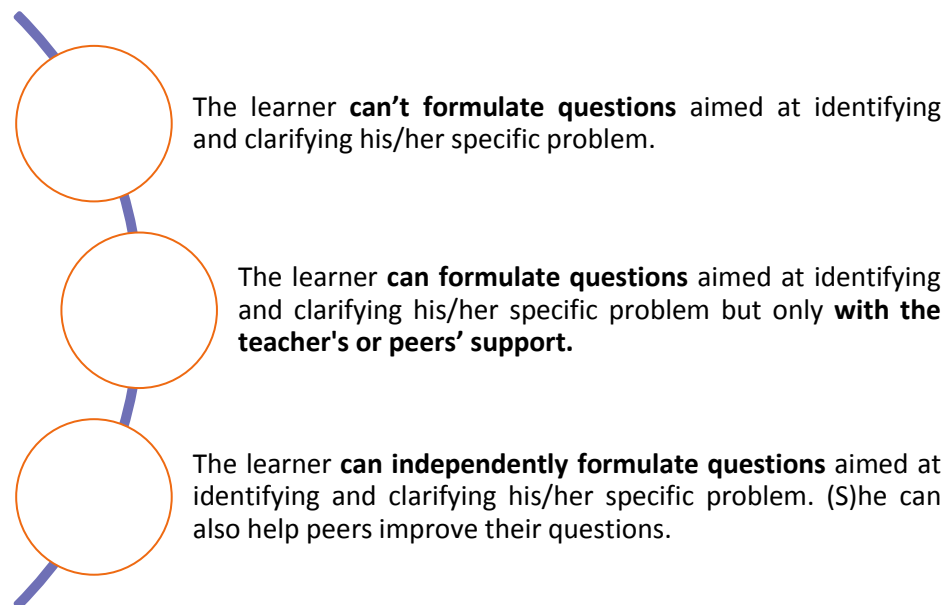
**Important note**

Please note that the learner's independence and disposition **cannot be** assessed unless problem-centredness has reached point (+).

**DISPOSITION OF THE LEARNER TOWARDS DEFINING QUALITY QUESTIONS**



**INDEPENDENCE OF THE LEARNER IN THE PROCESS OF DEFINING QUALITY QUESTIONS**



## 1. Element?



Passport

### Evaluation parameters

#### Learner's questions at Stage 1. Towards identification of the research element and its properties

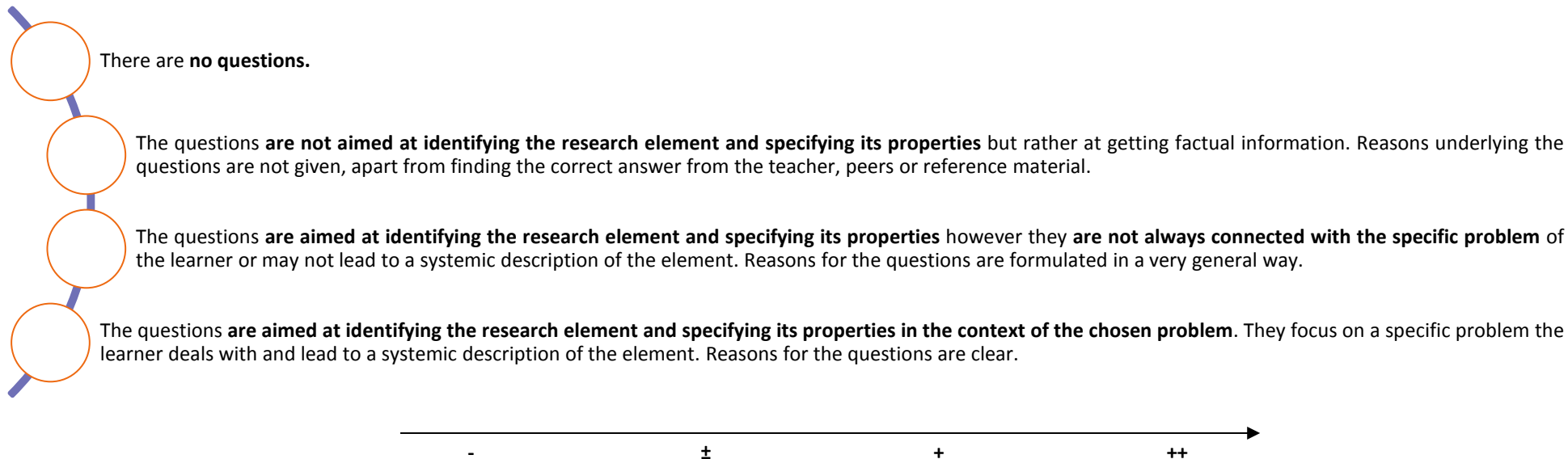
##### Important remark

The questions are formulated at Stage 1 as a response to the need to identify the element (what I deal with) and specify its properties via parameters and values (how I describe it). They may first be focused on general, randomly formulated characteristics of the element. The competent learner is, however, able to move from general and random characteristics to those specifically related to the problem the learner deals with (why I describe the element). This process results in a systemic description of the element through parameters and values.

A well-formulated specific question allows the learner to move towards:

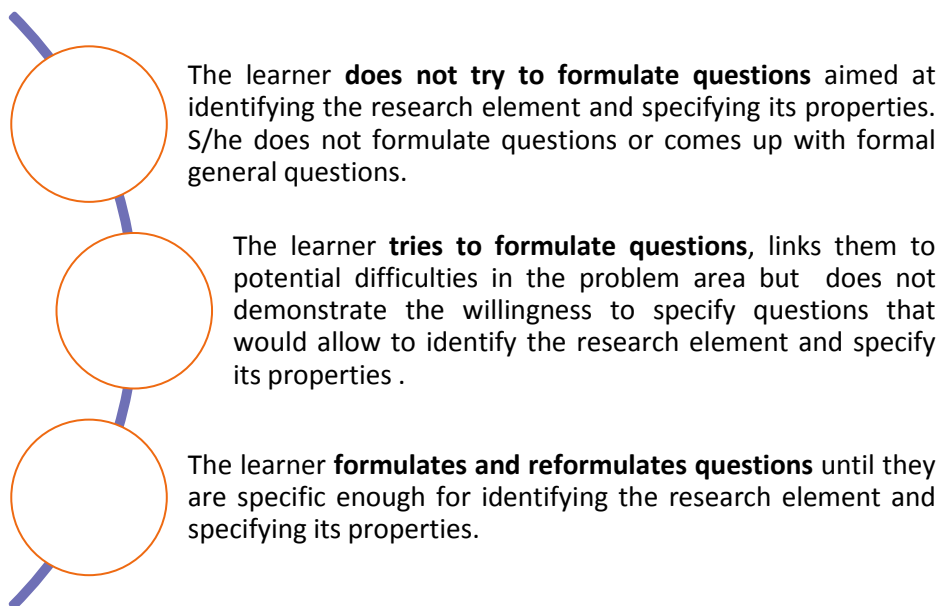
- finding and recognising the elements s/he is dealing with when resolving the chosen problem;
- describing the elements via parameters and their values;
- distinguishing between the elements or their forms;
- defining the objective for further work at Stage 2.

#### PROBLEM-CENTREDNESS OF THE QUESTION

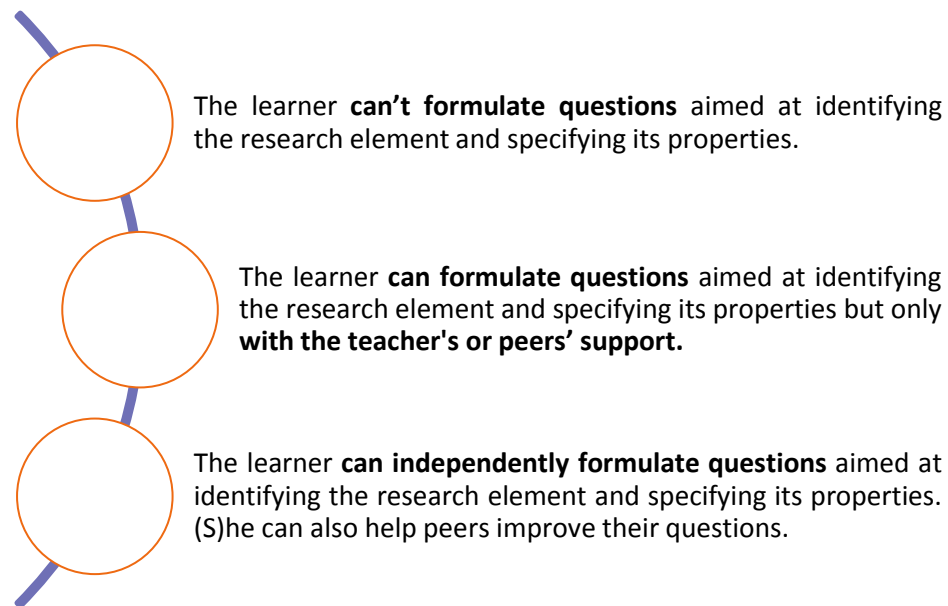


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## 2. Choice?



Hypothesis

### Evaluation parameters

#### Learner's questions at Stage 2. Towards formulation of a hypothesis for solving the problem

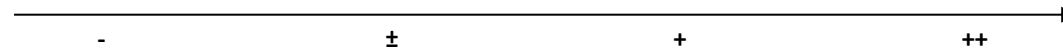
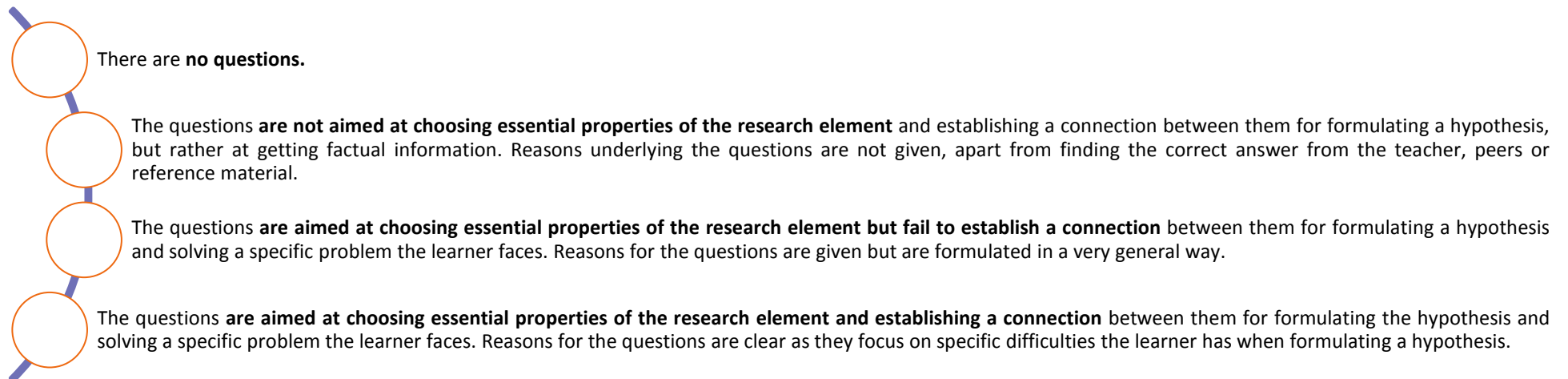
##### Important remark

The questions are formulated at the beginning of Stage 2 as a response to the need to choose properties of the research element essential for formulating a hypothesis that would help to solve a specific problem the learner faces. They may first be rather random and not focused on essential parameters for the defined problem and links between their various values. The competent learner is, however, able to move from random guesses to well formulated questions that help to solve the learner's specific problem.

A well-formulated specific question allows the learner to move towards:

- defining the essential parameters in the context of the learner's specific problem;
- establishing a connection between various values of the defined parameters in the "passport" of the element;
- formulating a hypothesis on resolving the initial problem based on the established connection;
- defining the objective for further work at Stage 3.

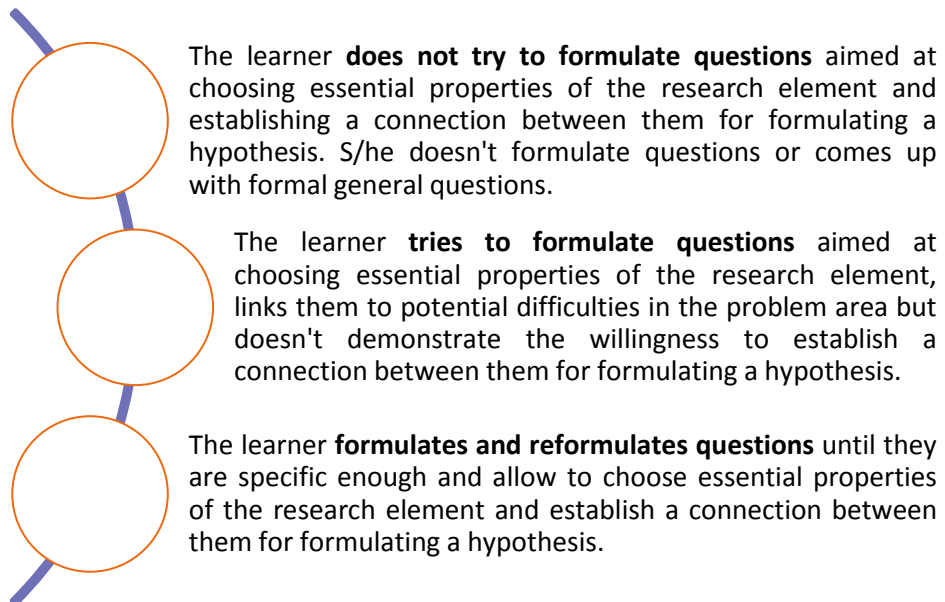
#### PROBLEM-CENTREDNESS OF THE QUESTION



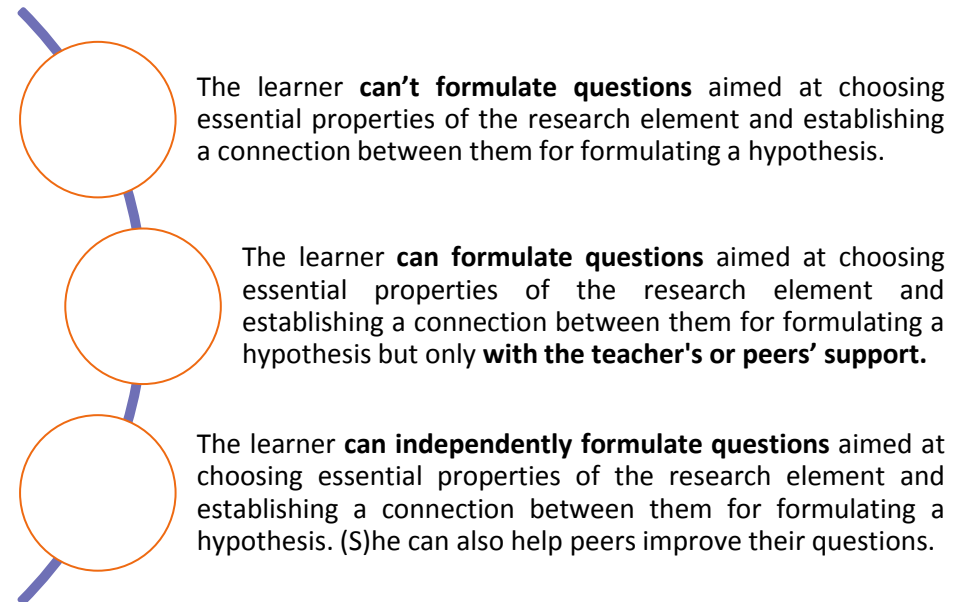
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### DISPOSITION OF THE LEARNER TOWARDS DEFINING QUALITY QUESTIONS



### INDEPENDENCE OF THE LEARNER IN THE PROCESS OF DEFINING QUALITY QUESTIONS





### 3. Valid?



Algorithm

#### Evaluation parameters

#### Learner's questions at Stage 3. Towards defining an algorithm

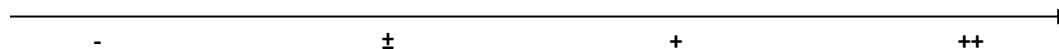
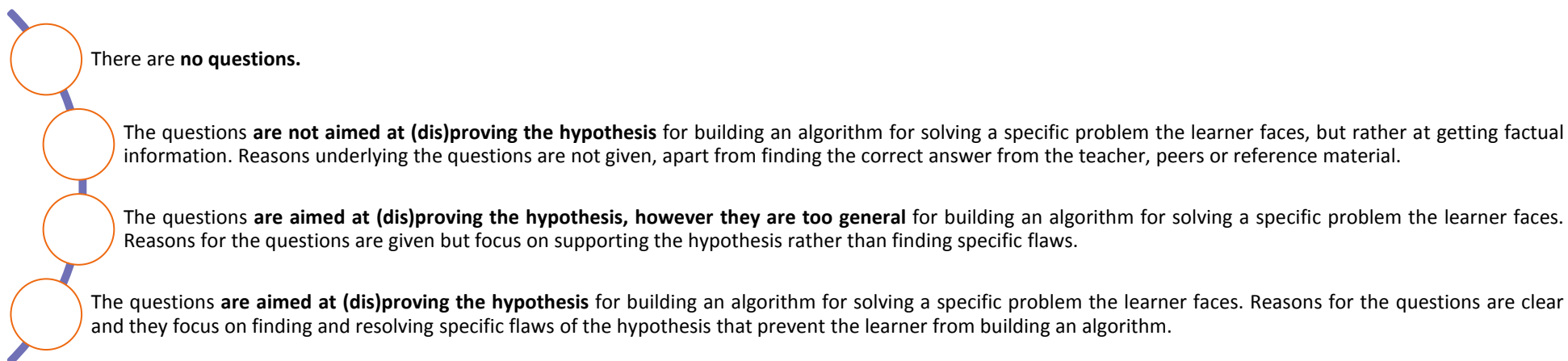
##### Important remark

The questions are formulated at Stage 3 as a response to the need to (dis)prove the formulated hypothesis and transform it to a rule or an algorithm for dealing with the specific problem the learner faces. They may first be directed at finding the proofs that support the initial hypothesis without going beyond the obvious. The competent learner, however, treats his/her own hypotheses as models that have drawbacks and applicability limits, so is able to focus on collecting more data for finding and eliminating flaws of the hypothesis and building the algorithm as a result.

A well-formulated specific question allows the learner to move towards:

- collecting the data as a result of following the hypothesis;
- selecting the data where the hypothesis “failed” and choosing those examples that will help to further improve the hypothesis;
- on the basis of the analysed data, build the algorithm;
- demonstrating how the proposed algorithm helps to resolve the problem;
- defining the objective for further work at Stage 4.

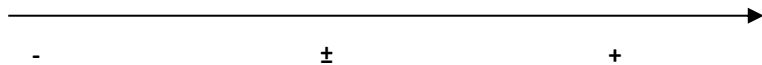
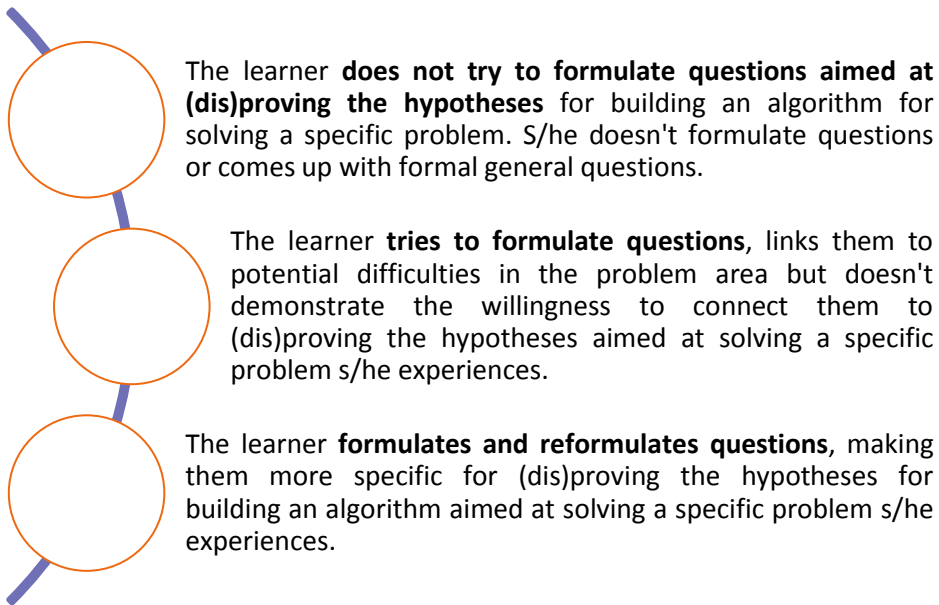
#### PROBLEM-CENTREDNESS OF THE QUESTION



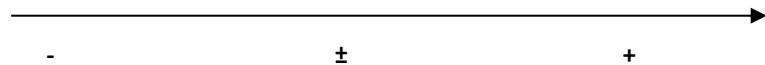
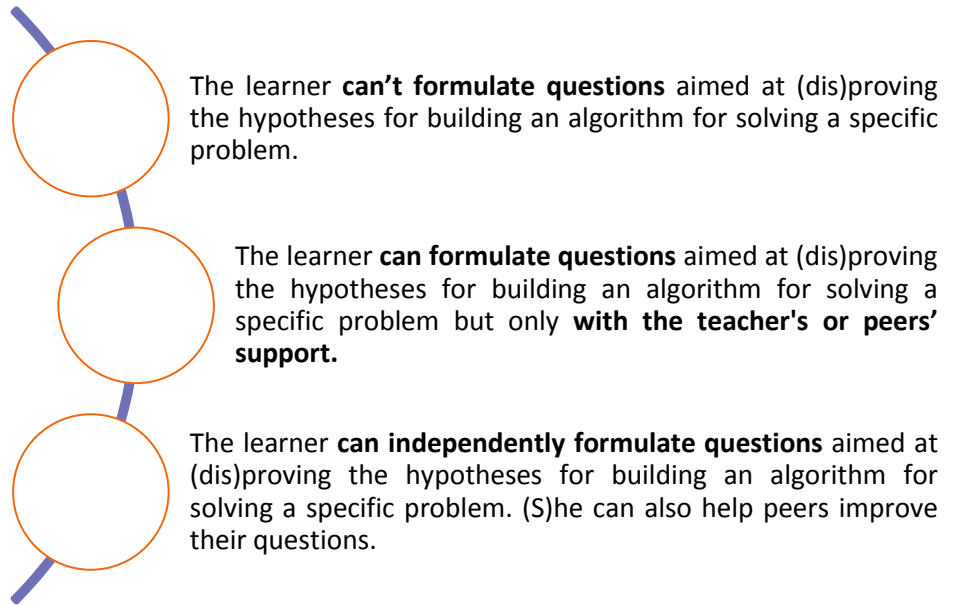
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**DISPOSITION OF THE LEARNER TOWARDS DEFINING QUALITY QUESTIONS**



**INDEPENDENCE OF THE LEARNER IN THE PROCESS OF DEFINING QUALITY QUESTIONS**



#### 4. Competent? Evaluation parameters



#### Learner's questions at Stage 4. Towards optimising the algorithm and identifying new problems

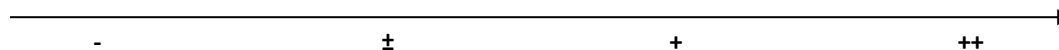
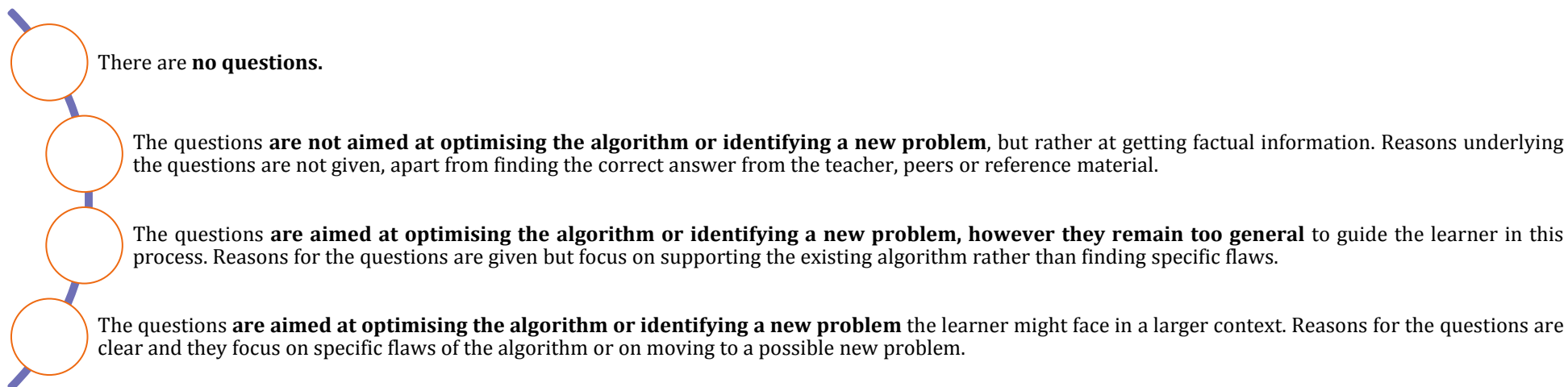
##### Important remark

The questions are formulated at Stage 4 as a response to the need to optimise the algorithm and apply it in a larger context. The competent learner understands that the algorithm s/he has developed should be aligned with their other algorithms and poses questions that guide them in this process. Additionally, the learner understands that each algorithm has its applicability limits and therefore takes a note of its flaws that may point to potential new problems to focus on in the future. Here the questions help to establish priorities for further learning.

A well-formulated specific question allows the learner to move towards:

- making a choice in any problematic situation that falls under the definition of the problem s/he has been working upon;
- comparing own algorithm for dealing with the problem with those developed by peers and optimising the algorithm if necessary;
- collecting the data when the algorithm does not seem to work and defining a possible new problem;
- formulating the objective for further work with a new problem (Stage 0).

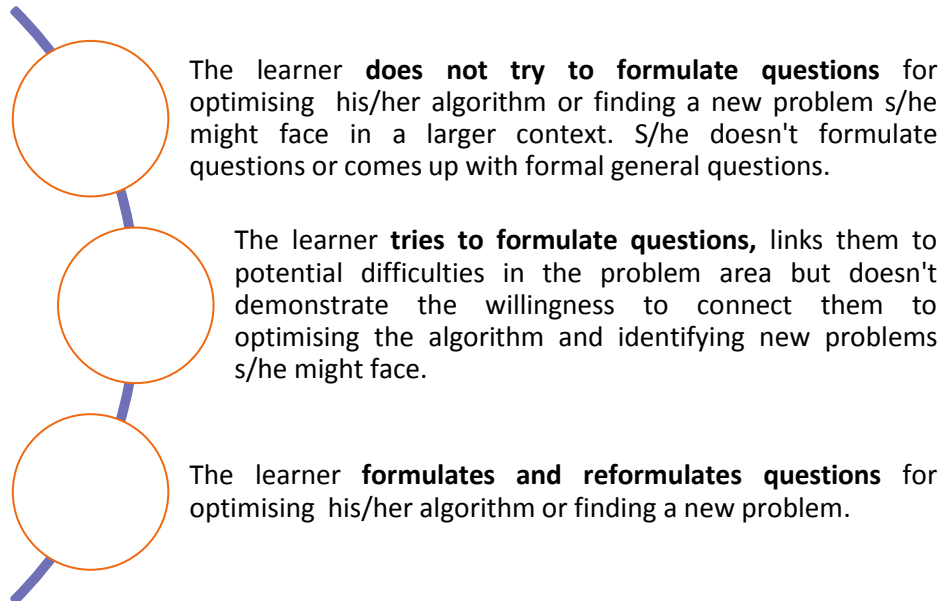
#### PROBLEM-CENTREDNESS OF THE QUESTIONS



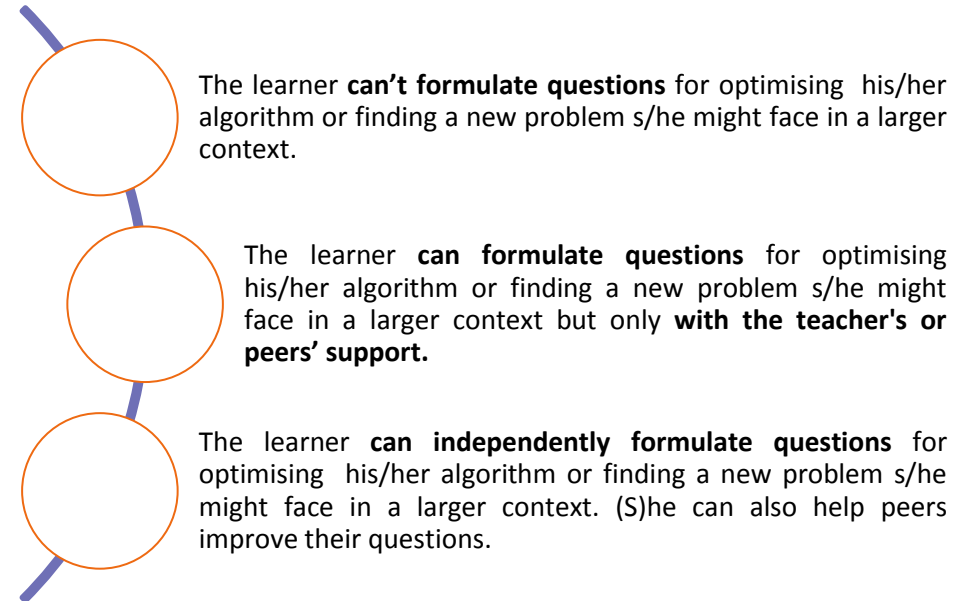
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### DISPOSITION OF THE LEARNER TOWARDS DEFINING QUALITY QUESTIONS



### INDEPENDENCE OF THE LEARNER IN THE PROCESS OF DEFINING QUALITY QUESTIONS



## Student assessment sheets

In this part you can find assessment sheets you can use at **any stage of competence development**. Before filling in the assessment sheet, write down the stage for which you are using it.

0. Can I?



Problem

1. Element?



Passport

2. Choice?



Hypothesis

3. Valid?



Algorithm

4. Competent?



New problem

There are **two types of sheets**, one for assessing individual students and another one to be used for assessing the progress of the class as a whole.



Individual student assessment sheet



Class assessment sheet

Each type of the assessment sheet offers **three evaluation parameters**:

- ❖ **problem-centredness of questions;**
- ❖ **disposition of students;**
- ❖ **independence of students.**



## Individual student assessment sheet

### Quality of questions: problem-centredness of questions

Student name	Student's question(s)	Problem-centredness of questions			
		No questions	Not problem focused	Partially problem focused	Problem focused
S1		_____→			
S2		_____→			
S3		_____→			
S4		_____→			
S5		_____→			



## Individual student assessment sheet

### Quality of questions: disposition & independence of students

Student name	Student's question(s)	Problem-centredness of questions	Disposition of students			Independence of students			Progress bar
		Problem focused +	Doesn't do -	Does... but +/-	Does +	Can't do -	Can do with support +/-	Can do independently +	
S1			→			→			novice → competent +    ++    +++
S2			→			→			novice → competent +    ++    +++
S3			→			→			novice → competent +    ++    +++
S4			→			→			novice → competent +    ++    +++
S5			→			→			novice → competent +    ++    +++



## Class assessment sheet

### Quality of questions: problem-centredness of questions

Class \_\_\_\_\_

Date of assessment	Problem-centredness of questions				Notes
	No questions	Not problem focused	Partially problem focused	Problem focused	
T1	All Most Half Few None	All Most Half Few None	None Few Half Most All	None Few Half Most All	
T2	All Most Half Few None	All Most Half Few None	None Few Half Most All	None Few Half Most All	
T3	All Most Half Few None	All Most Half Few None	None Few Half Most All	None Few Half Most All	
T4	All Most Half Few None	All Most Half Few None	None Few Half Most All	None Few Half Most All	





## Class assessment sheet

### Quality of questions: disposition & independence of students

Class \_\_\_\_\_

Date of assessment	Problem-centredness of questions	Disposition of students			Independence of students			Notes
	Problem focused	Doesn't do	Does... but	Does	Can't do	Can do with support	Can do independently	
T1	Few Half Most All	All Most Half Few None	None Few Half Most All	None Few Half Most All	All Most Half Few None	None Few Half Most All	None Few Half Most All	
T2	Few Half Most All	All Most Half Few None	None Few Half Most All	None Few Half Most All	All Most Half Few None	None Few Half Most All	None Few Half Most All	
T3	Few Half Most All	All Most Half Few None	None Few Half Most All	None Few Half Most All	All Most Half Few None	None Few Half Most All	None Few Half Most All	
T4	Few Half Most All	All Most Half Few None	None Few Half Most All	None Few Half Most All	All Most Half Few None	None Few Half Most All	None Few Half Most All	