

Diagnostic questions:

1. Can you, in your own words, tell me what you should answer/figure out/solve in the task?

2. What have you done/how have you reasoned up to now?

3. Why have you done it/reasoned that way?

		PROBLEM-SOLVING STEPS		
		INTERPRETATION OF THE PROBLEM	CHOICE/CREATION OF SOLUTION METHOD; IMPLEMENTATION OF SOLUTION	EVALUATION OF SOLUTION METHOD
PROBLEM-SOLVING SKILLS	The student's awareness and order of what he is doing when he solves the problem		<p>A-F First level. Indicates diagnosis of the student's developmental needs/next step</p> <p>A1 Second level. Indicates a more detailed specification of the main level <i>Italicized text describes examples of feedback that can be given</i></p> <p>A2 Second level. Indicates a more detailed specification of the main level <i>Italicized text describes examples of feedback that can be given</i></p>	
	Methods and strategies the student has for approaching and solving the problem			

The three columns indicate which problem-solving phase/dimension the student is in

Diagnostic questions are used to identify the problem-solving phase/dimension the student is in

The two lines indicate the choice of approach and how it is then implemented

In the "cells" there are six dimensions (A-F) that describe differences in method and strategy implementation/choice...

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PROBLEM-SOLVING SKILLS	The student's awareness and order of what he is doing when he solves the problem	<p><i>The student does not realise that his interpretation is incorrect</i></p> <p><i>Examples of feedback:</i></p> <ul style="list-style-type: none"> • Read the task aloud • Do you understand the words used in the problem? • What are you going to find or show? • Can you now explain what information is available and what answer you should find? <p><i>The student does not realise that he missed important information in the assignment</i></p> <p><i>Example of feedback:</i></p> <ul style="list-style-type: none"> • Is there information in the task that can give you an idea of what to do? 	<p>A. The student does not realise that the chosen approach to exploring the problem or the creation of a solution method does not lead to an appropriate solution to the problem</p> <p>A.1. Wrong overall approach</p> <p><i>Example of feedback:</i></p> <ul style="list-style-type: none"> • I see that you are trying to solve the problem by (summarise the wrong approach, but do not describe what is wrong). Can you tell us how you reasoned here and how it will help you solve the problem? <p>A.2. Local error in part of the approach</p> <p><i>Example of feedback:</i></p> <ul style="list-style-type: none"> • I see that you are trying to solve the problem by (point out the part of the approach that contains the error, but do not describe what is wrong). Can you tell me how you reasoned here and how this part will help you solve the problem? 	<p>A. The student has a solution method that he is trying to implement, but does not realise that the solution method is incorrect</p> <p><i>Examples of feedback:</i></p> <ul style="list-style-type: none"> • Can you tell me why this way of solving the task works? • Why is the answer X? • Can you show that you have found the right solution? • Can you verify your solution in any way? • Is your answer reasonable?
		<p>B. The student has interrupted the attempt to explore or create a solution method, and/or is unable to choose an appropriate approach</p> <p>B.1. The student has made a good attempt to explore or create a solution method, but is stuck</p> <p><i>Example of feedback:</i></p> <ul style="list-style-type: none"> • Can you move forward in any way with what you have done so far? <p>B.2. The student's attempt is not good enough to build on</p> <p><i>Examples of feedback:</i></p> <ul style="list-style-type: none"> • Would you be able to solve the task in any other way? • Can you spot something that is wrong? 	<p>B. The student has a solution method that he thinks or knows may be incorrect, but is unable to verify</p> <p>B.1. The student has made a good attempt to verify his solution method, but is stuck</p> <p><i>Example of feedback:</i></p> <ul style="list-style-type: none"> • Here you have done this; you can move on with what you have come up with so far (aimed at the part of the attempt that can be developed) <p>B.2. The student is unsure whether the solution method is incorrect, but does not try to determine whether this is the case</p> <p><i>Examples of feedback:</i></p> <ul style="list-style-type: none"> • Can you tell me why this way of solving the task works? • Can you somehow check the answer? If so, how? 	
	Methods and strategies the student has for approaching and solving the problem	<p>D. The student tries but finds no suitable strategy for exploring or creating a solution method</p> <p><i>Examples of feedback:</i></p> <ul style="list-style-type: none"> • Try to draw a picture/make a table/solve a simpler version/divide the solution into different steps/make a diagram/use concrete material/guess and try/look for patterns (or another strategy; choose suitable) • Are there any calculations you need to do? Choose calculation method 	<p>D. The student tries but finds no suitable strategy to verify his solution method</p> <p><i>Example of feedback:</i></p> <ul style="list-style-type: none"> • Try to draw a picture/judge if it is reasonable/try to find examples where it is not true/if you look at what you did in the previous task, can it be true then? 	
		<p>E. The student is about to formulate a good strategy for exploration or create a solution method, but does not quite reach it</p> <p><i>Example of feedback:</i></p> <ul style="list-style-type: none"> • Summarise what is good and lead to what needs to be developed (without specifying a solution method) 	<p>E. The student is about to formulate a good strategy for verification, but fails with the last steps</p> <p><i>Example of feedback:</i></p> <ul style="list-style-type: none"> • Summarise what is good, lead the way to what needs to be developed 	

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PROBLEM-SOLVING SKILLS	The student's awareness and order of what he is doing when he solves the problem		<p>C. The student realises that the <i>chosen approach</i> to exploring the problem or the creation of a solution method <i>leads to</i> an appropriate solution to the problem</p> <p>C.1. Wrong overall approach <i>Example of feedback:</i></p> <ul style="list-style-type: none"> I see that you are trying to solve the problem by (summarise the correct approach, but do not describe what is correct). Can you tell us how you reasoned here and how it will help you solve the problem? 	<p>C. The student has a solution method that he is trying to implement and realises that the solution method is correct</p> <p><i>Examples of feedback:</i></p> <ul style="list-style-type: none"> Can you explain to me what you have done and how you have reasoned? Can you show that you have found the right solution? Can you verify your solution in any way? Are there different ways to do this? Can you tell me why this way of solving the task works? Why is the answer X?
	Methods and strategies the student has for approaching and solving the problem		<p>F. The student <i>finds</i> a suitable strategy for exploring or creating a solution method</p> <p><i>Example of feedback:</i></p> <ul style="list-style-type: none"> Summarise what is good, without specifying the solution method 	<p>F. The student has formulated a good strategy for verification</p> <p><i>Examples of feedback:</i></p> <ul style="list-style-type: none"> Can you draw any conclusions from what you have done? Could you solve the task in a different way? With other strategies methods? What is a more or less efficient/smart/good solution? Has working with the problem given you new knowledge? If so, what? Are there more solutions to the problem? Have you worked with a similar problem before? Compare.