### Handout 4: Practical advice for teaching problem solving

| **Allow students time to understand and engage with the problem** | • Take your time, don’t rush.  
• What do you know?  
• What are you trying to do?  
• What is fixed? What can be changed?  
• Don’t ask for help too quickly - try to think it out between you. |
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<td>Discourage students from rushing in too quickly or from asking you to help too soon.</td>
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| **Offer strategic rather than technical hints** | • How could you get started on this problem?  
• What have you tried so far?  
• Can you try a specific example?  
• How can you be systematic here?  
• Can you think of a helpful representation? |
| Avoid simplifying problems for students by breaking it down into steps. | |
| **Encourage students to consider alternative methods and approaches** | • Is there another way of doing this?  
• Describe your method to the rest of the group.  
• Which of these two methods do you prefer and why? |
| Encourage students to compare their own methods. | |
| **Encourage explanation** | • Can you explain your method?  
• Can you explain that again differently?  
• Can you put what Sarah just said into your own words?  
• Can you write that down? |
| Make students do the reasoning, and encourage them to explain to one another. | |
| **Model thinking and powerful methods** | • Now I’m going to try this problem myself, thinking aloud.  
• I might make some mistakes here - try to spot them for me.  
• This is one way of improving the solution. |
| When students have done all they can, they will learn from being shown a powerful, elegant approach. If this is done at the beginning, however, they will simply imitate the method and not appreciate why it was needed. | |