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<table>
<tr><th rowspan="2">Skill</th><th colspan="3">Score</th><th rowspan="2">Notes or Comments</th></tr>
<tr><th>Proficient</th><th>Developing</th><th>Needs Revisiting</th></tr>
<tr><td rowspan="2">Decide What to Model</td><td>• Assumptions made are clearly identified and justified. Resulting limitations are stated when appropriate.
• Variables of interest are clearly identified and chosen wisely, and appropriate units of measure are used.</td><td>• Assumptions are noted but lacking in justification or difficult to find.
• Variables of interest are noted, but may lack justification, be difficult to find, or not be measured with appropriate units.</td><td>• No assumptions are stated.
• No variables are defined.</td><td></td></tr>
<tr><td colspan="4">To improve at this skill, you could:
• Ask questions about the situation to understand it better
• Check the assumptions you're making to see if they're reasonable (Try asking a friend, or imagining that you're a person involved in the scenario. Would those assumptions make sense to you?)
• Double-check the variables you've identified: Are there other quantities in the situation that could vary? Is there something you've identified as a variable that is actually fixed or determined? (Remember that more abstract things like time and speed are also quantities.)</td></tr>
<tr><td rowspan="2">Formulate a Mathematical Model</td><td>• An appropriate model is chosen and represented clearly.
• Diagrams, graphs, etc. are clear and appropriately labeled.</td><td>• Parts of the model are unclear, incomplete, or contain mistakes.</td><td>• No model is presented, or presentation contains significant errors.</td><td></td></tr>
<tr><td colspan="4">To improve at this skill, you could:
• Check your model more carefully to make sure it really fits well
• Consider a wider variety of possible models, to find one that fits the situation better
• Think about the situation more deeply before trying to find a model
• Convince a skeptic: Pretend that you think your model is inadequate, or ask a friend to pretend to be skeptical of it. What would a skeptic find wrong with your model? Try to fix those things, or explain why they're not actually problems.</td></tr>
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<tr><td rowspan="2">Use Your Model to Reach a Conclusion</td><td>● Solution is relevant to original problem.
● Reader can easily understand the reasoning leading to the solution.
● Relevant details are included like units of measure.</td><td>● Solution is not well-aligned to original problem, or aspects of the solution are difficult to understand or incomplete.</td><td>● No solution is provided.</td><td></td></tr>
<tr><td colspan="4">To improve at this skill, you could:
● Double-check your calculations: Show them to someone else to see if they agree, or take a break and look at your calculations again later
● Make sure your calculations are justified by your model: Ask yourself how you decided what to calculate, and see if your reasoning matches up with your model
● Think more deeply about what your conclusions mean in the original scenario: Imagine you're a person involved in the scenario, or explain your conclusions to someone else and see if they have questions</td></tr>
<tr><td rowspan="2">Refine and Share Your Model</td><td>● The model’s implications are clearly stated.
● The limitations of the model and solution are addressed.</td><td>● The limitations of the model and solution are addressed but lacking in depth or ignoring key components.</td><td>● No interpretation of model and solution is provided.</td><td></td></tr>
<tr><td colspan="4">To improve at this skill, you could:
● Think more creatively about what your conclusions mean: Ask yourself "If I was involved in this situation, what would I understand better because of these conclusions? What would I want to do next?"
● Be skeptical of your model: What don't you like about it, and what can you do to fix those things?
● Explain your model to someone else: Tell them how it works and why it's good. If you're not sure how it works or why it's good, you might need to change it.</td></tr>
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