

| Skill | Score | | | Notes or Comments |
|--------------------------------|--|--|---|---|
| | Proficient | Developing | Needs Revisiting | |
| Decide What to Model | <ul style="list-style-type: none">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. | <ul style="list-style-type: none">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. | <ul style="list-style-type: none">No assumptions are stated.No variables are defined. | |
| Formulate a Mathematical Model | <p>To improve at this skill, you could:</p> <ul style="list-style-type: none">Ask questions about the situation to understand it betterCheck 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.) | | | |
| | <ul style="list-style-type: none">An appropriate model is chosen and represented clearly.Diagrams, graphs, etc. are clear and appropriately labeled. | <ul style="list-style-type: none">Parts of the model are unclear, incomplete, or contain mistakes. | <ul style="list-style-type: none">No model is presented, or presentation contains significant errors. | <p>To improve at this skill, you could:</p> <ul style="list-style-type: none">Check your model more carefully to make sure it really fits wellConsider a wider variety of possible models, to find one that fits the situation betterThink about the situation more deeply before trying to find a modelConvince 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. |

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| Use Your Model to Reach a Conclusion | <ul style="list-style-type: none">• Solution is relevant to original problem. Reader can easily understand the reasoning leading to the solution.• Relevant details are included like units of measure. | <ul style="list-style-type: none">• Solution is not well-aligned to original problem, or aspects of the solution are difficult to understand or incomplete. | <ul style="list-style-type: none">• No solution is provided. | |
| | <p>To improve at this skill, you could:</p> <ul style="list-style-type: none">• 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 | | | |
| Refine and Share Your Model | <ul style="list-style-type: none">• The model's implications are clearly stated.• The limitations of the model and solution are addressed. | <ul style="list-style-type: none">• The limitations of the model and solution are addressed but lacking in depth or ignoring key components. | <ul style="list-style-type: none">• No interpretation of model and solution is provided. | |
| | <p>To improve at this skill, you could:</p> <ul style="list-style-type: none">• 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. | | | |