

Getting Started with Math Modeling

Start small. You don't have to start with a large-scale, open-ended project like, "What's the relationship between speed and gas mileage?" Instead, start with a smaller activity, such as this one, adapted from Math Techbook™, Grade 7:

When converting a book to a movie, a page of description lasts 10 seconds, a page of dialogue lasts 1 minute, and a page of action lasts 90 seconds. Analyze a few pages of your favorite book, and predict how long its movie version would run. What parts of the book would you skip to make the movie shorter?

Don't reinvent the wheel! Modeling tasks should be real problems, where students have to make choices, create a model, interpret results, and revise. But don't spend hours generating new problems. Instead, try an activity from these resources:

- Robert Kaplinsky: <http://www.robertkaplinsky.com/lessons>
- Moody's Challenge: <http://m3challenge.siam.org/resources/sample-problems>
- Catalog of 3-Act Tasks: <http://tinyurl.com/Catalog3Acts>
- COMAP: <http://www.mathmodels.org/problems/>

Use a variety of tasks. Some modeling problems have an open beginning, middle, and end. Others are closed in various parts. Use a variety, and choose based on whether the purpose is to prepare students for a new concept or to practice skills.

Help students be successful. Your first activity shouldn't throw students into the deep end of the pool. Encourage success with these techniques:

- Scaffold the problem by suggesting the types of tools that they should use.
- Restrict the size of the problem by providing a limited set of information.
- Ask, "What are questions that someone might have?" (If you try the activity at <http://tinyurl.com/tixprob>, you may be amazed by your students' questions.)
- Prepare students for variables by asking, "What would change? What would stay the same?"
- Identify alternative entry points for students who have trouble getting started.

Engage in math modeling often. Modeling is a skill that must be practiced, just like solving an equation or graphing a line. Modeling doesn't need to happen every day, but students only get better by tackling authentic problems often. Make modeling a regular part of your instruction.

It's worth it. Yes, modeling activities take longer than just teaching students how to implement an algorithm. But the rewards are greater, too. Students who engage in modeling develop greater conceptual understanding and procedural fluency.

Manage the conversation. The effectiveness of a modeling activity is directly proportional to the quality of classroom discussion. For guidance, read [5 Practices for Orchestrating Productive Mathematics Discussions](#).