THINKING WITH NUMBERS

Lesson Descriptions

Using Bounds

Often when you can use an estimate for a computation, you only need to know if the answer is greater than a lower bound, less than an upper bound, or sometimes if it is between a lower bound and an upper bound. For example, suppose a canoe has a limit of 350 pounds, two people who want to use that canoe might want to compare their total weight to 350. Your total weight needs to be less than 350 for the canoe to be safe. Sometimes you need to make sure the answer is more than a lower bound. For example, suppose you want to make two batches of cookies. It takes 1 cup of butter to make one batch. You have 3 cups of butter. In this case, 1 cup + 1 cup is the lower bound. You need at least that much butter to make two batches of cookies. Sometimes you need to know if the total is between two amounts. For example, suppose you need to send a package that has two items in it, one that weighs 4 pounds and another that weighs 7 pounds. If packages that weigh between 8 and 15 pounds can be sent for a special price, will your package qualify? In each of these cases, an accurate solution is not needed as long as the estimates indicate that the solution is within the bounds. Depending on the context of the question you are trying to solve, using an upper bound, a lower bound, or both may be an efficient way to answer the question.

Expected content outcomes include helping children learn:

- to make sense of using bounds to estimate,
- to recognize that using bounds to estimate can be strategically efficient, given the context of the question, and
- to become proficient in using bounds to estimate.