

## Guidelines for Mathematics Questions and Responses in Pen-pal Letters

When you solve a problem posed by your pen-pal, you are modeling the way a mathematics question should be answered, so be thoughtful and thorough in your response.

- Where appropriate, refer to Polya's problem solving strategies, as in "If we draw a picture, it will help us understand the problem ...".
- Write out the process you used to solve the problem. Include ideas that did not work, and why they did not.
- Do not leave out steps. Do not use expressions like "obvious", "easy to see", or "clearly".
- If the question is an arithmetic question, make sure your pen-pal knows exactly what algorithm you used. Give a verbal description of what you are doing. For example, "First I added the 9 and the 7 to get 16. I wrote the 6 in the ones column of the answer and added the 1 to the numbers in the tens column ..." Is this the way you add numbers? Can you think of a different way to add these numbers?"
- If the pen-pal's question is vague, ask for clarification. This is part of "Understand the Problem". Use that expression. Say "I am trying to understand the problem, but I am not sure about .... Do you mean ...?"

When you ask your pen-pal a question, you are modeling the way we think about mathematics. Again, thoughtful and thorough are the key ideas.

- Be sure the question is grade-appropriate and standards based. You have the South Carolina Standards and what they mean for each grade level.
- Make sure your question is stated clearly. Be prepared to clarify your question if your pen-pal does not understand.
- Be certain that you can solve the problem yourself and provide a clear solution that follows the guidelines for solving a problem given to you by your pen-pal.

When you read and respond to your pen-pal's solution, you are modeling mathematics dialogue.

- Always respond to their work. Give praise where praise is due.
- If they did not solve the problem the way you expected, evaluate their solution in light of Polya's problem solving strategies. Did they understand the question? Was your question clear? Clarify if not.
- Did they devise an alternate method for solving the problem? This one can be tricky. If they did get the correct answer by an alternate method, was it just a coincidence or would that method always produce a correct solution? That is, is their method another good algorithm? Their method can also be good even if they obtained a wrong answer; maybe they made a minor mistake carrying out their method.
- Encourage the 4<sup>th</sup> Polya step – Look Back. If they answer a question correctly, respond positively to what they did and then encourage them to think about the problem more generally.