Assessment and standards-based grading rubric

You are boiling some water so that you can cook pasta when one of your family members tells you that it's best to use a large volume of water. You wonder why that might be true and decide to run some tests.

You decide to cook four batches of pasta. Each time, you use a different pot to bring a different amount of water to a boil. Then you add one cup of uncooked pasta, record the temperature, and the time to cook after adding the uncooked pasta. You also write down some observations about how well the pasta cooked. Your results are below:

Volume of water	Temperature after adding pasta	Time to cook	Other observations
1.0 liter	77^{o}C	12 minutes	Pasta ended up mushy and stuck together
2.0 liters	88^{o}C	10 minutes	Pasta was a little mushy, but not terrible
3.0 liters	91^{o}C	9 minutes	Pasta cooked well
4.0 liters	94^{o}C	8 minutes	Pasta cooked well

1) Take a look at the temperature data. What patterns can you identify related to temperature?

2) Based on what you have learned about temperature and thermal energy, draw a model and explain in words why the temperature data that you collected make sense. (Be sure to refer to at least one of the patterns you identified in Question #1.)

Grading Rubric

	Data interpretation	**Explanatory Model**
Proficient	Clearly describes multiple patterns: with a larger volume of water, the temperature of the water does not decrease as much when the noodles are added and that this also results in shorter cook times and better pasta.	Model accurately shows transfers of thermal energy between water, noodles, and heat source (stove). Model accurately represents how larger volumes of water have greater thermal energy. The model is used to accurately explain patterns in the data.
Developing	Describes only one pattern; includes vague descriptions of the patterns.	Model includes some elements related to energy but does not represent some essential parts of the system. The model is related to the data, but does not fully

		explain key patterns.
Uninformed	Does not identify any meaningful patterns in the data.	The model shows few accurate elements and does not explain the patterns in the data.