**Name:** _____

## Thermodynamic States

*Working in small groups (2 or 3 people), solve as many of the problems below as possible. Try to resolve questions within the group before asking for help. Each group member should then write up solutions in their own words.*

**Orient:** The contour map represents possible measured values for a kilogram of water vapor. Without pointing to it or marking it, have one member of your group select a location (a state) on the contour map. Describe the state so that another member of the group can mark it. How many pieces of information do you need to specify the state?

**Coordinate:** Find your state on the new graph. Specify your state in as many ways as possible.

**Explore:** Choose a second, nearby state and mark it on the graph. In as many different ways as you can, describe how to get from your old state to your new state.

Can you find a nearby state where the path involves holding one of the thermodynamic variables constant? 2 variables? 3 variables?

**New Representation:** Can you find the states you have been considering on these alternate representations:

(1) A rubber sheet that can be stretched and squished so that the $S$ and $V$ contours are straight and perpendicular to each other.
(2) A plastic surface whose height represents the internal energy of the system.

## Activity Evaluation

**What was the main point of this activity?**

**Describe one thing you understand as a result of this activity.**

**Describe one thing that is confusing after completing this activity.**