

Name: \_\_\_\_\_

### “Squishability” of Water Vapor

*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.*

**Estimate:** The plot represents measurements on a kilogram of water vapor in an insulated piston (a cylindrical thermos with a moveable top).

Imagine a thermodynamic quantity, the “*squishability*”, which is the negative rate of change of the volume of a fluid as the pressure changes.

Pick a point on the plot and estimate the squishability of water vapor:

- (1) with *temperature* held constant
- (2) with *entropy* held constant

**Experiment:** Design an experiment to measure the squishability of water vapor at constant *temperature* and describe your experiment precisely. What data would you collect and how would you use it to calculate the squishability?

In your experiment, what variables are you considering to be independent? What variables are dependent?

**Explore:** What would happen if you tried to measure the squishability with *both* temperature and entropy fixed? Alternatively, what would happen if you tried to measure the squishability in a container that cannot change size?

### **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.**