

COOLING POTATO LAB: Rates of cooling and ratios of surface area to volume (HPT101 lesson 2)

You will need: Large potato or sweet potato (or rutabaga, squash, etc), knife, foil, oven, ruler, and a digital oven thermometer

- 1) Cut three cubes of potato: small, medium and large. Measure each width in cm. SMALL _____ MED _____ LG _____
- 2) Wrap the cubes in foil and put them in an oven at about 350 F for at least 30 minutes. You want to make sure that the large cube gets hot all the way through.
- 3) Take the internal temperatures of the cubes every 2 minutes and record them on the data chart below.
- 4) Transfer the numbers to the graph, and connect the dots for each potato to make a curved line. Label the lines.
- 5) Calculate the volume of each cube by multiplying width three times. (Ex: $2 \times 2 \times 2 = 8$ cubic centimeters)
- 6) Calculate the surface area of each cube. (Multiply width times width times 6, since there are 6 sides.)
- 7) Calculate each ratio by dividing the surface area by the volume. (SA over V)

Volume of small cube: _____ cm^3 Surface area of small cube: _____ cm^2 SA/V ratio: _____
 Volume of med. cube: _____ cm^3 Surface area of med. cube: _____ cm^2 SA/V ratio: _____
 Volume of large cube: _____ cm^3 Surface area of large cube: _____ cm^2 SA/V ratio: _____

| | | | | | | | | | | | |
|--------|---------|---|---|---|---|----|----|----|----|----|----|
| | initial | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| Small | | | | | | | | | | | |
| Medium | | | | | | | | | | | |
| Large | | | | | | | | | | | |

