

(f) Sometimes an approximation or estimate gives valuable information without a complicated simulation. Consider the everyday problem of cooling a cup of tea. This problem is roughly equivalent. We can use it to get useful order-of-magnitude estimates. Use the result from (e) as an estimate of the characteristic cooling time of a cup of diameter a , and your own experience as to how long it takes for a cup of tea to cool significantly (that gives you an estimate for D). Using this estimate for D , make a small table of cooling times:

	diameter	cooling time
spoonful	1 inch	0.0012 min
cup	2 inches	0.0047min
pot of soup	4 inches	0.0187 min
home hot water tank	24 inches	0.67min