## Lab 13: The DIY Inductor

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Table 1: Sizes	
Copper wire length $l$	
Diameter of pen $d$	
Number of windings $N$	
Length of the inductor $a$	

Table 2: First Approximation for $R_{int}$							
f(Hz)	s/DIV	$V_{RL}(V)$	$V/DIV$ for $V_{RL}$	$V_L(V)$	$V/DIV$ for $V_L$	$R_{int}(\Omega)$	
1000							

	Table 2: First Approximation for $L$									
Γ	f(Hz)	s/DIV	$V_{RL}(V)$	$V/DIV$ for $V_{RL}$	$V_L(V)$	$V/DIV$ for $V_L$	$I_R(A)$	$Z_{L,eff}(\Omega)$	$X_L(\Omega)$	L(H)
Γ	65000									

Table 3: The Impedance of an Inductor							
f(Hz)	s/DIV	$V_{RL}(V)$	$V/DIV$ for $V_{RL}$	$V_L(V)$	$V/DIV$ for $V_L$		
1000							
22000							
32000							
39000							
45000							
50000							
55000							
60000							
65000							

Setup

setup

Graph 1

graph 1

## Calculation

Calculation

• Compare the obtained value to that predicted for an ideal long inductor made of a wire of length l and taking up length a along the toothpick,  $L = \frac{l^2}{a} \times 10^{-7} H$