CRAFTING MATERIAL INTERFACES

MAS S62, E14-493
Instructor: Leah Buechley
Tuesdays 3-6pm
http://material.media.mit.edu/

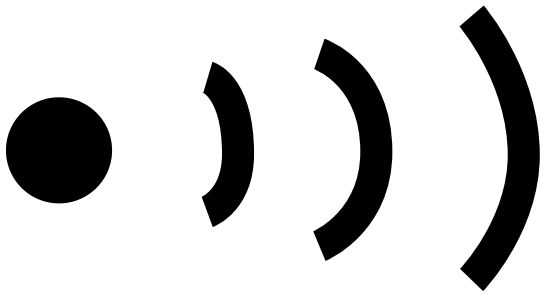
SENSORS

SWITCHES

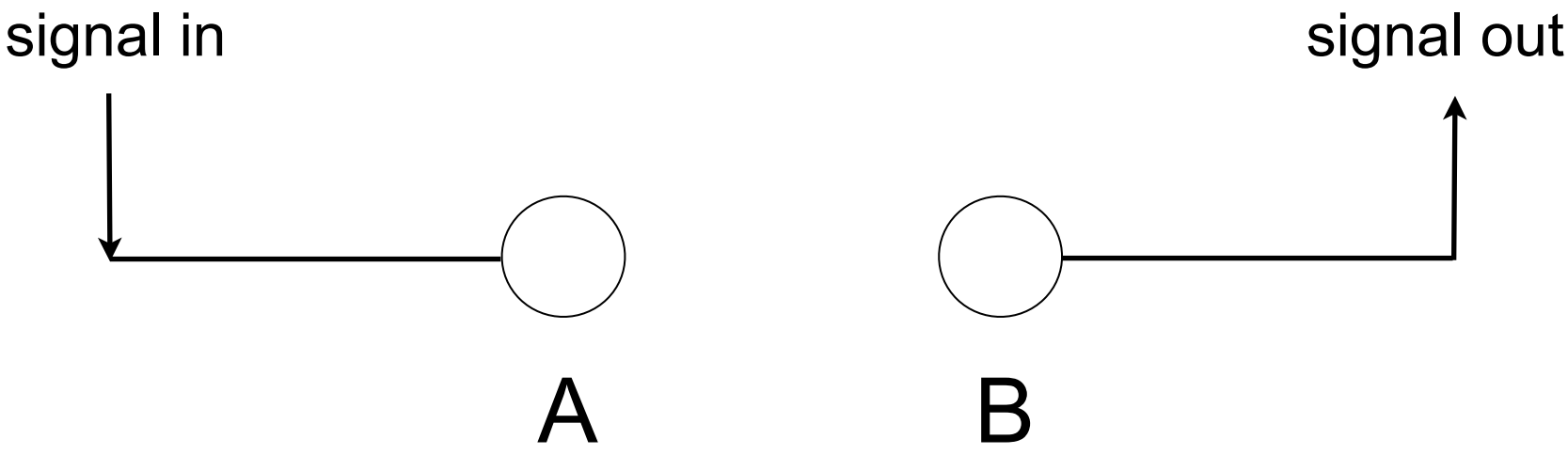
sensing continuity/connectedness

“Continuity”: conductivity, connectedness

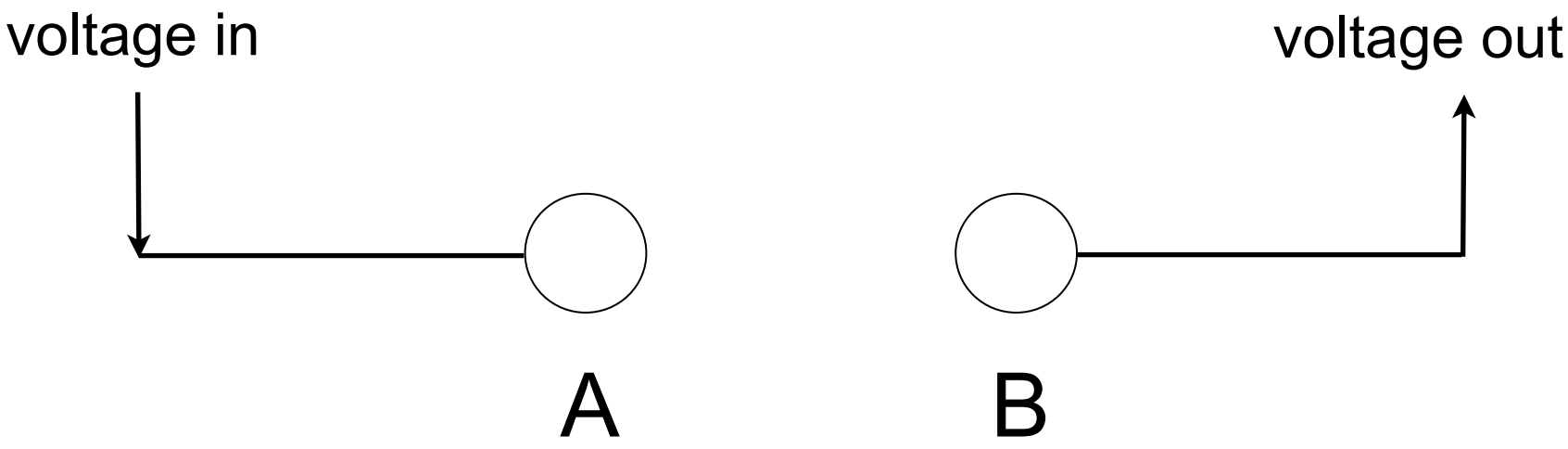
is point A connected to point B? is this material conductive?




EXTECH
DC
AUTO
399.9
mV
SELECT
DATA
HOLD
Hz
µA
mA
10A
Ω
V
°C
°F
OFF
Auto
Power
Off
10A
COM
V·Ω
CAP·Hz
mA·Temp
10A
For
15 sec
MAX
every
15 min
UNFUSED
600V
MAX
600V AC
600V DC
200mA MAX
CAT II 600V
MN36 AUTORANGING MULTIMETER



are points A and B connected?



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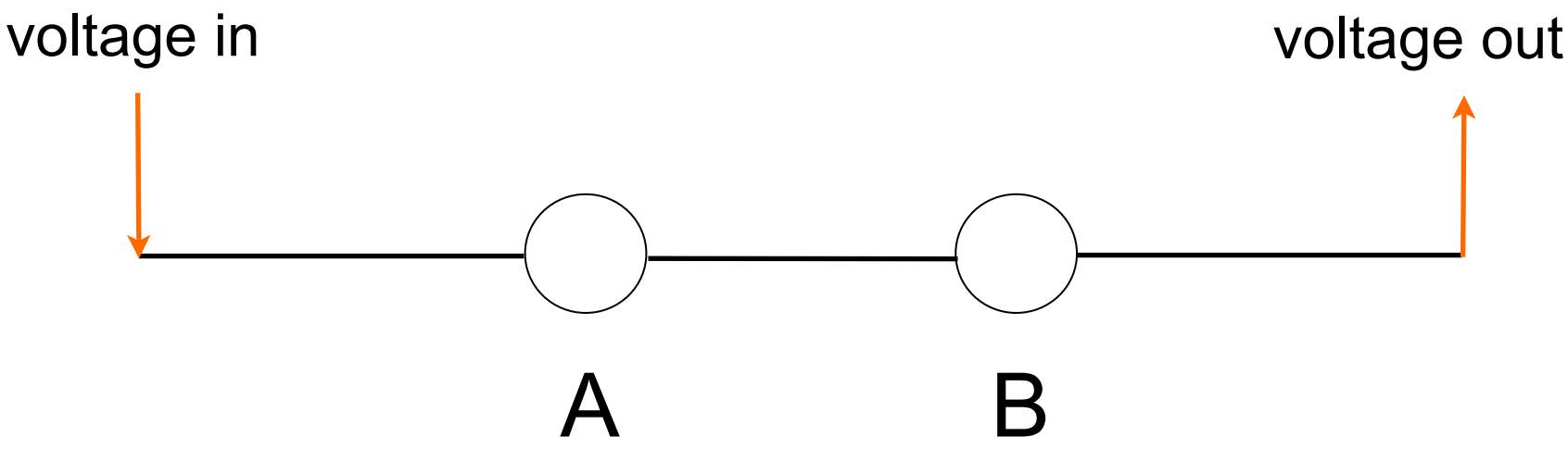
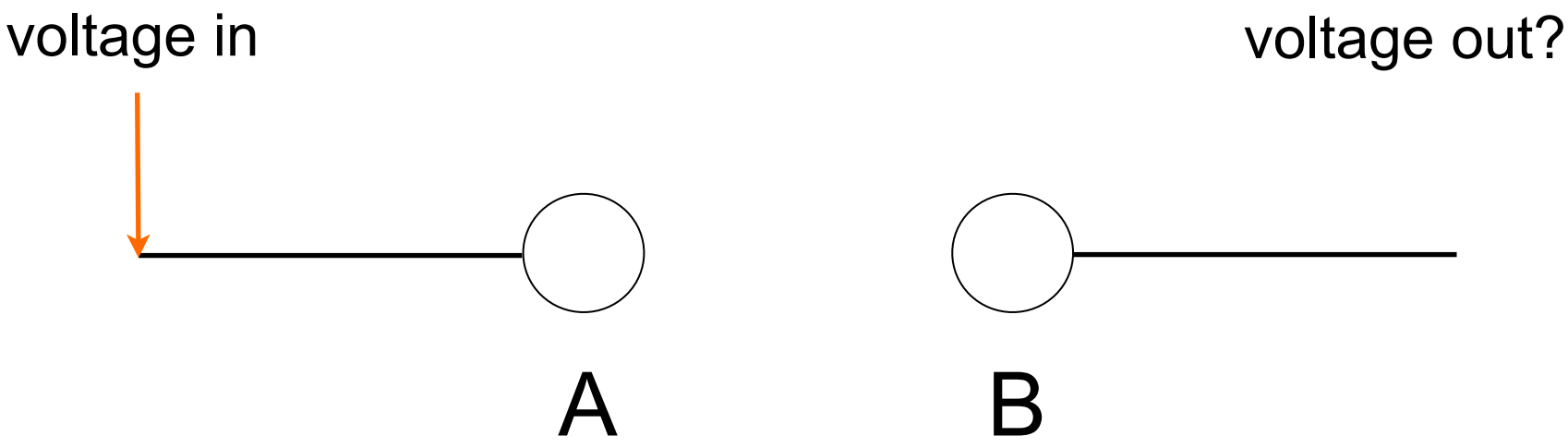
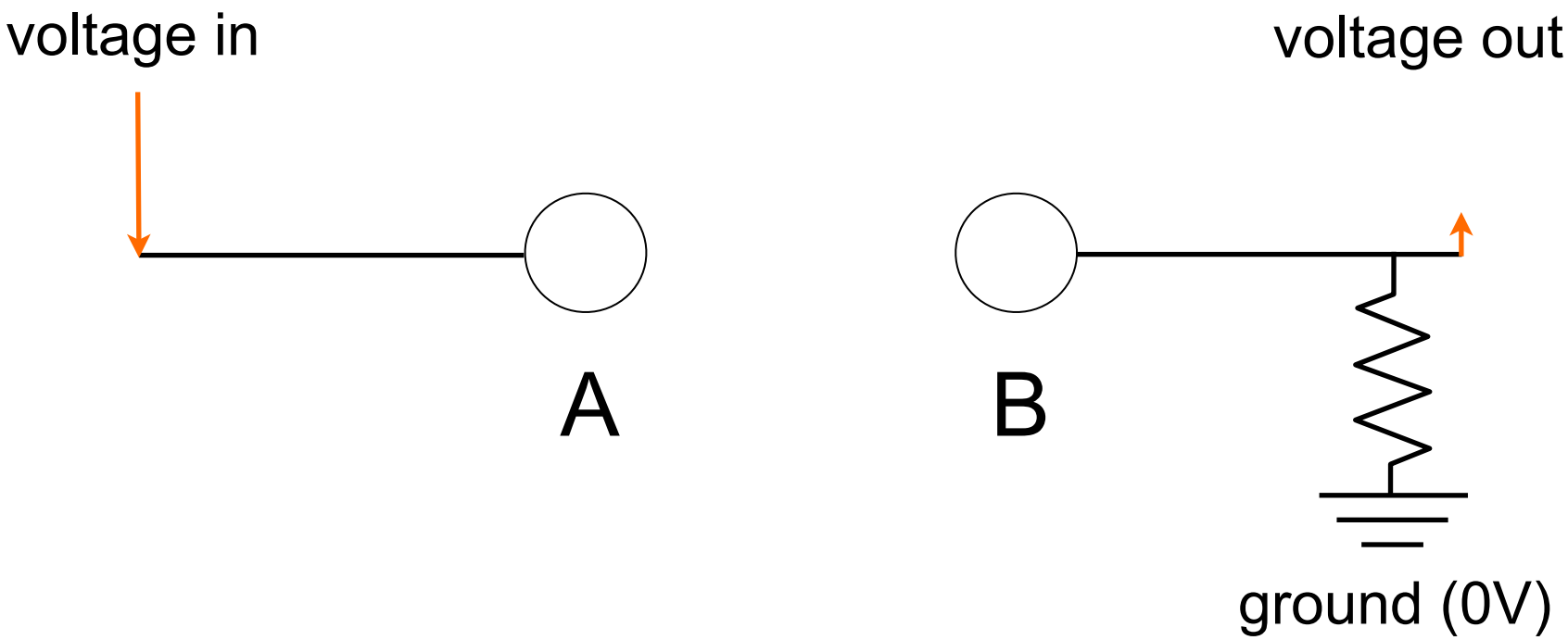
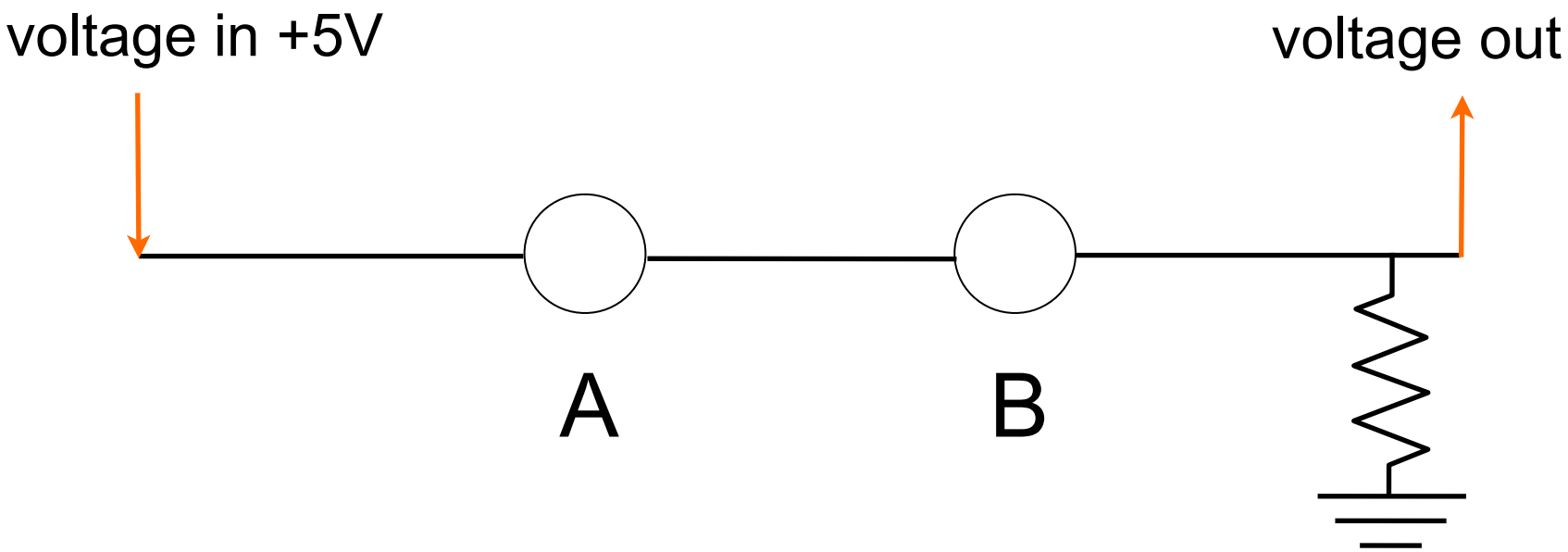
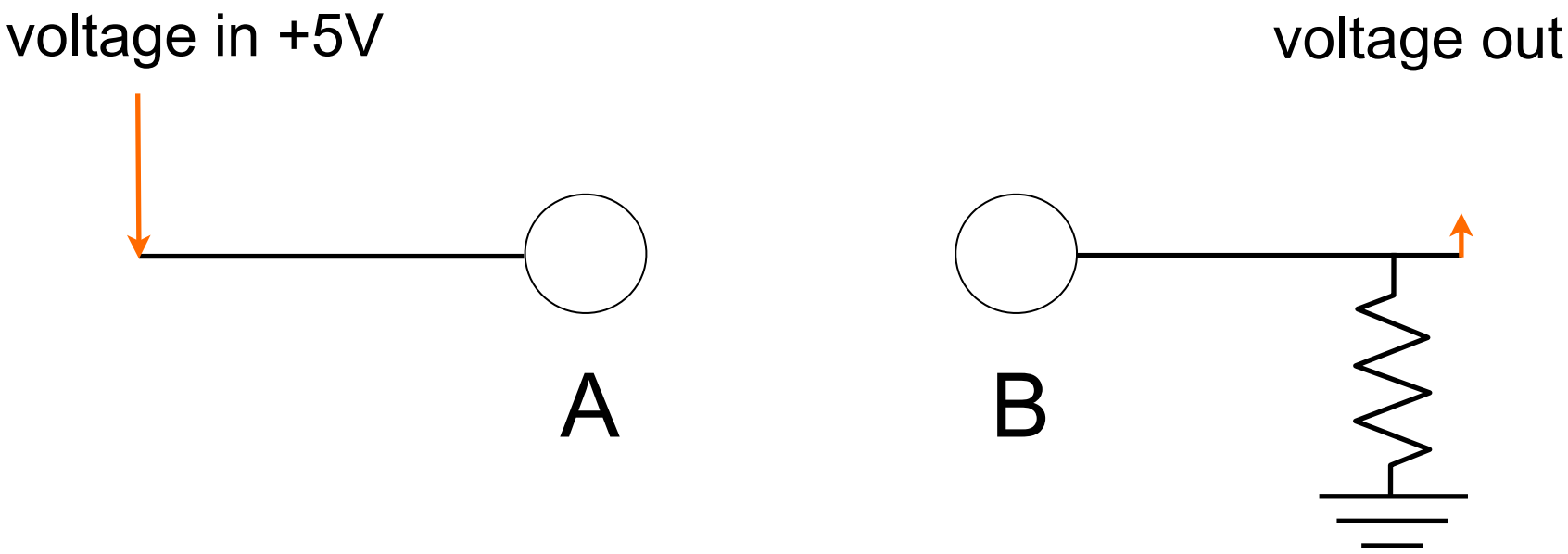


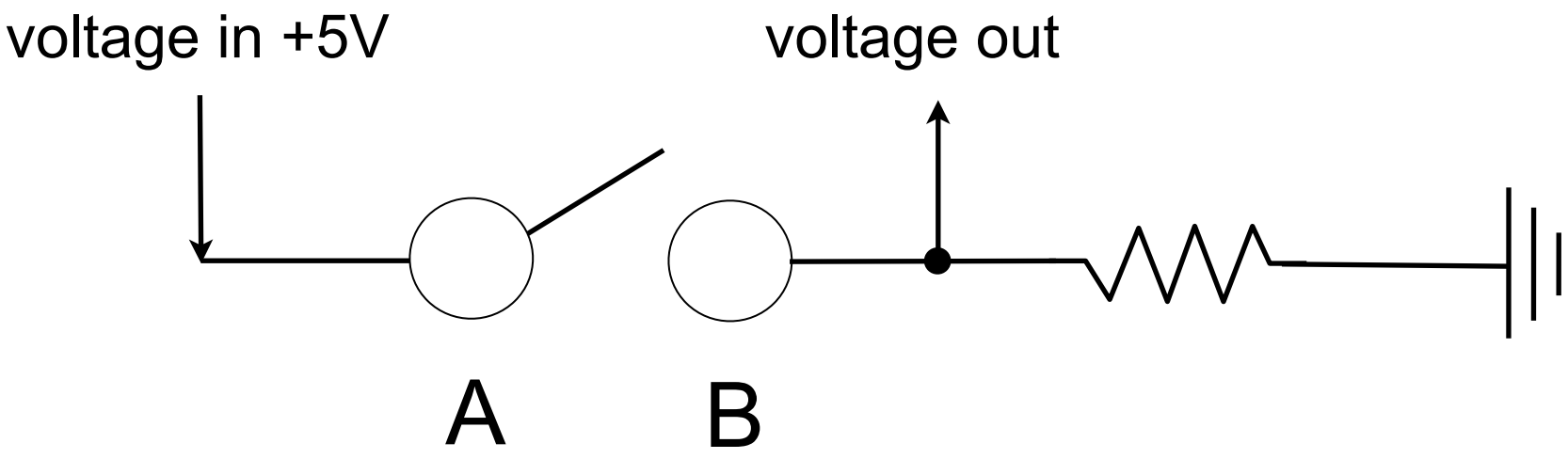
are points A and B connected?

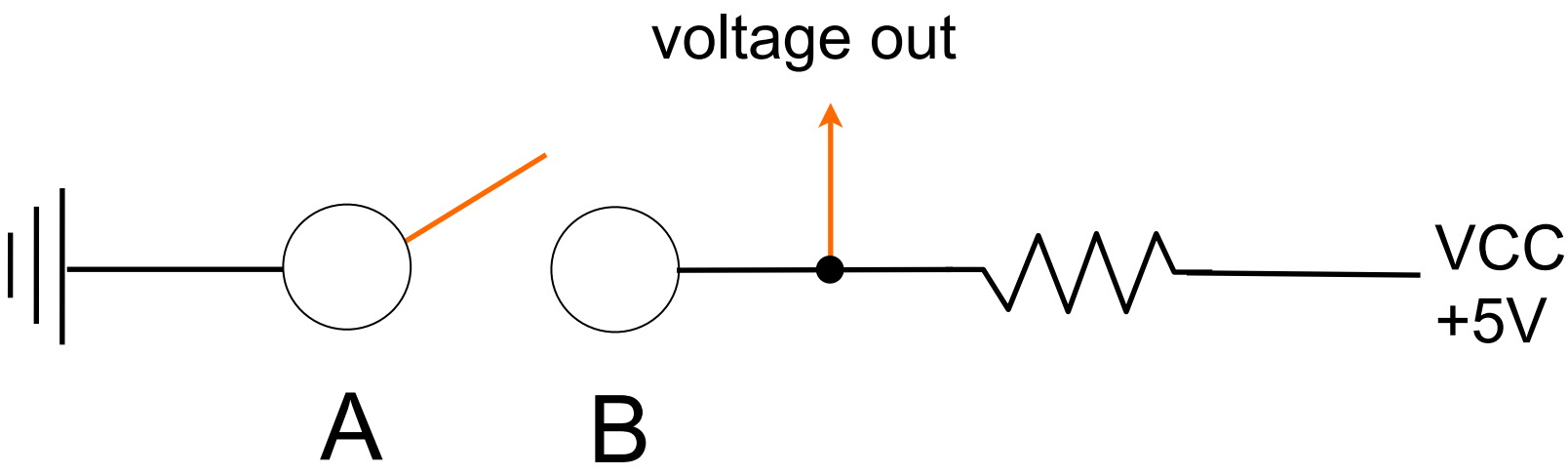

voltage in
voltage out?
A
B

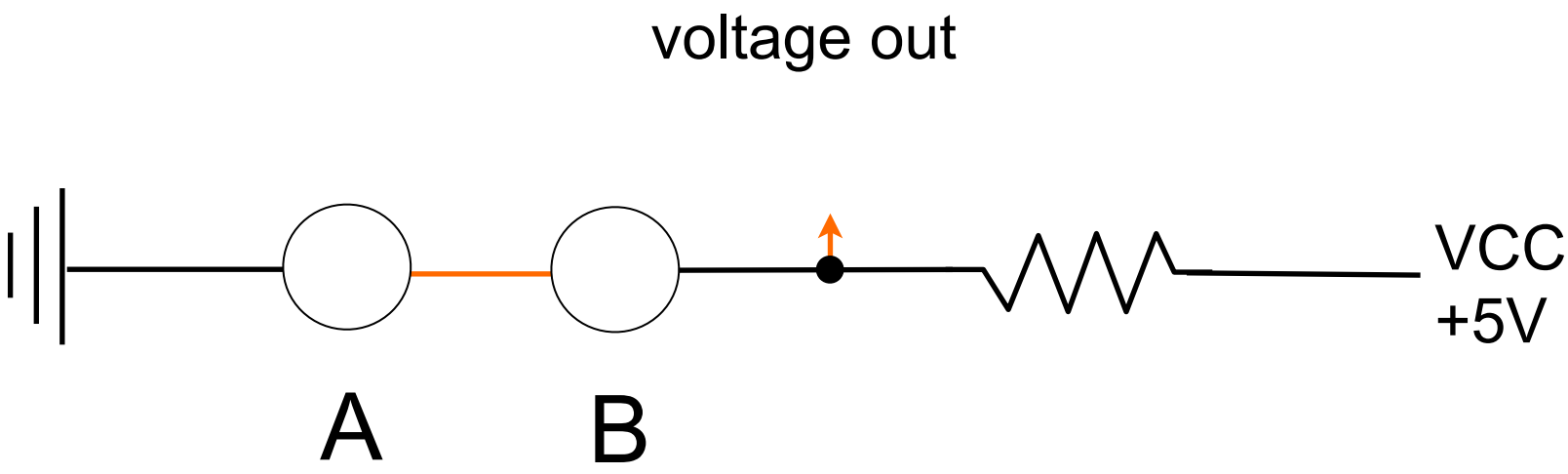

voltage in
voltage out
A
B
ground (0V)


voltage in +5V
voltage out
A
B


voltage in +5V
voltage out
A
B


voltage in +5V
voltage out
A
B


voltage out
VCC
+5V
A
B


voltage out
VCC
+5V
A
B

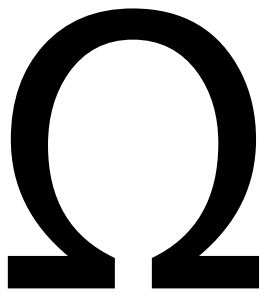
RESISTIVE SENSORS

sensing change in
electrical resistance

Resistance

How conductive is this material?

measured in Ohms

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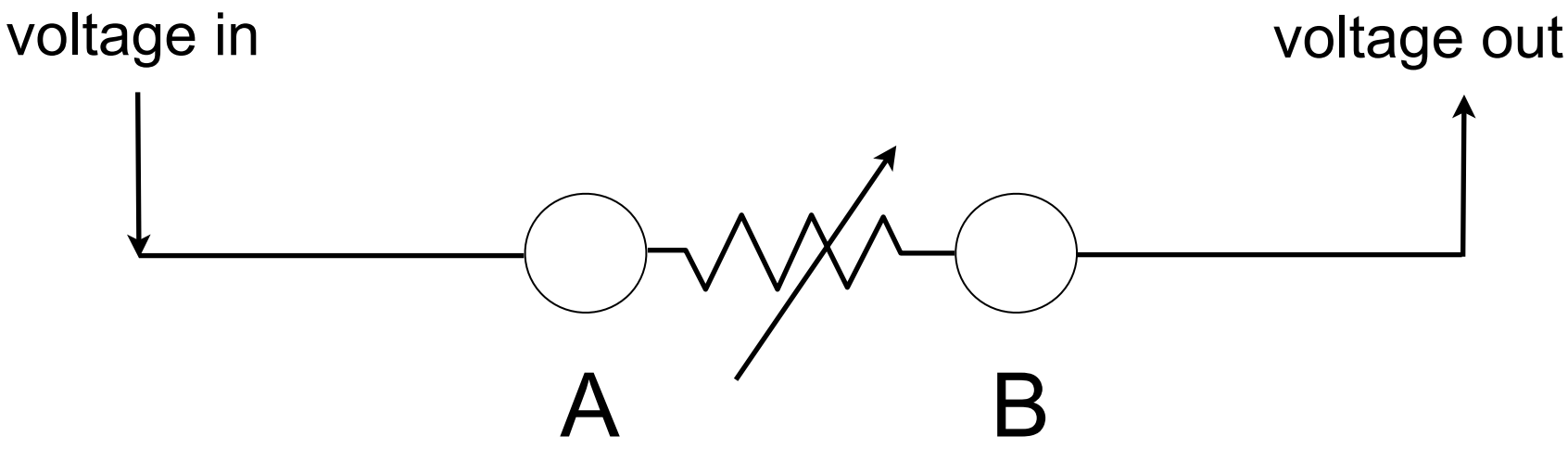
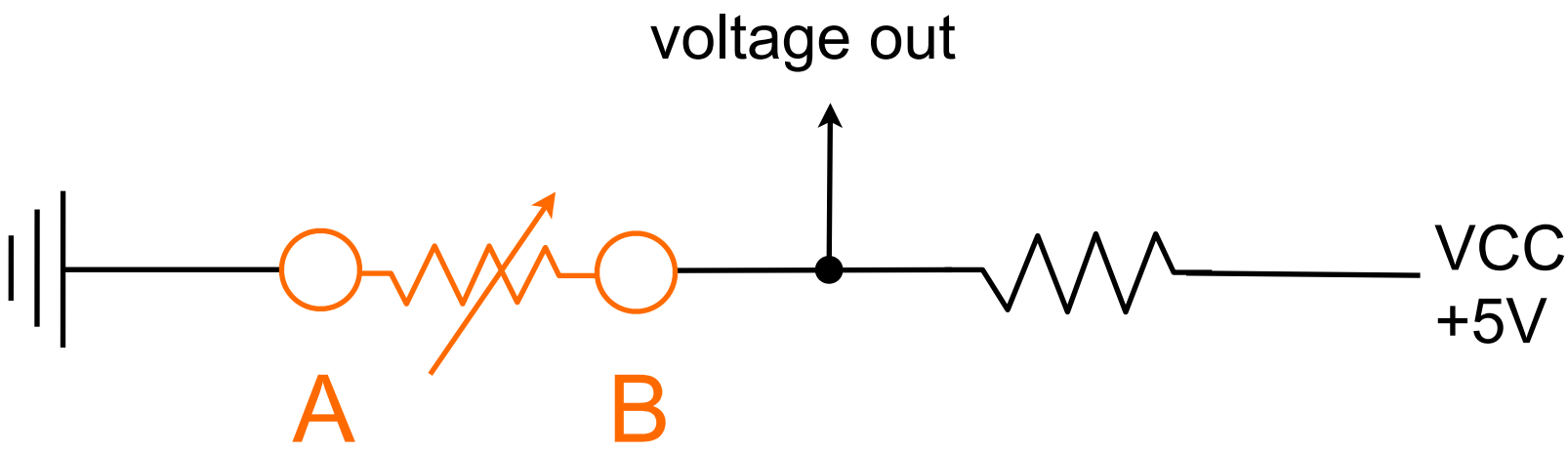
CAT II 600V
MN36 AUTORANGING MULTIMETER

resistance

	x1	Ω
kilo	x1,000	KΩ
mega	x1,000,000	MΩ



what is the resistance between point A and point B?



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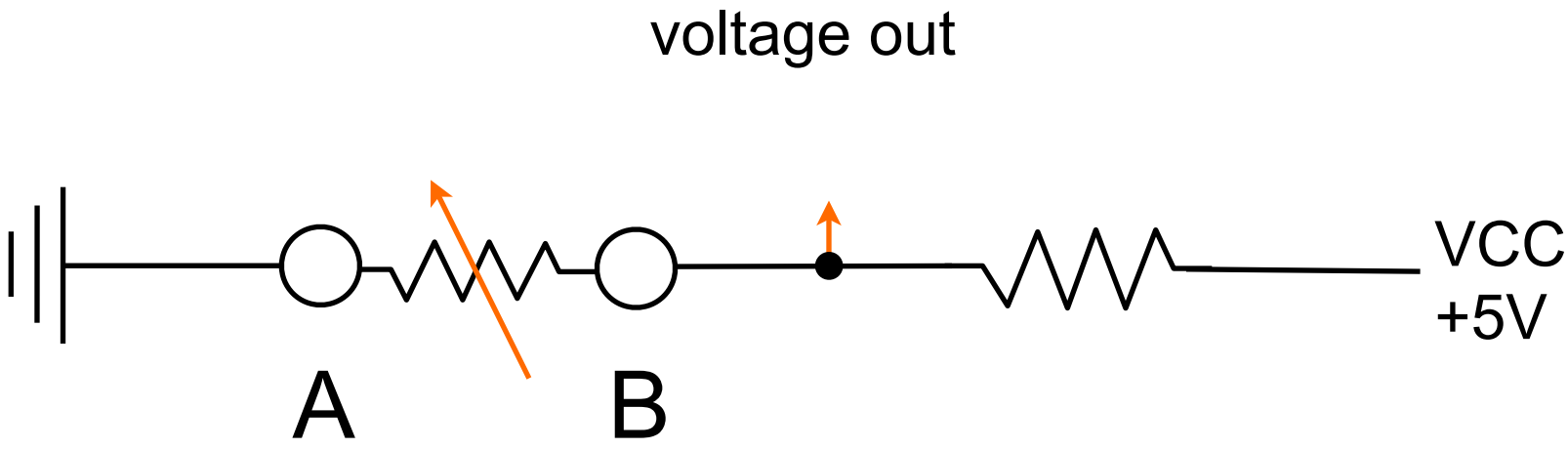

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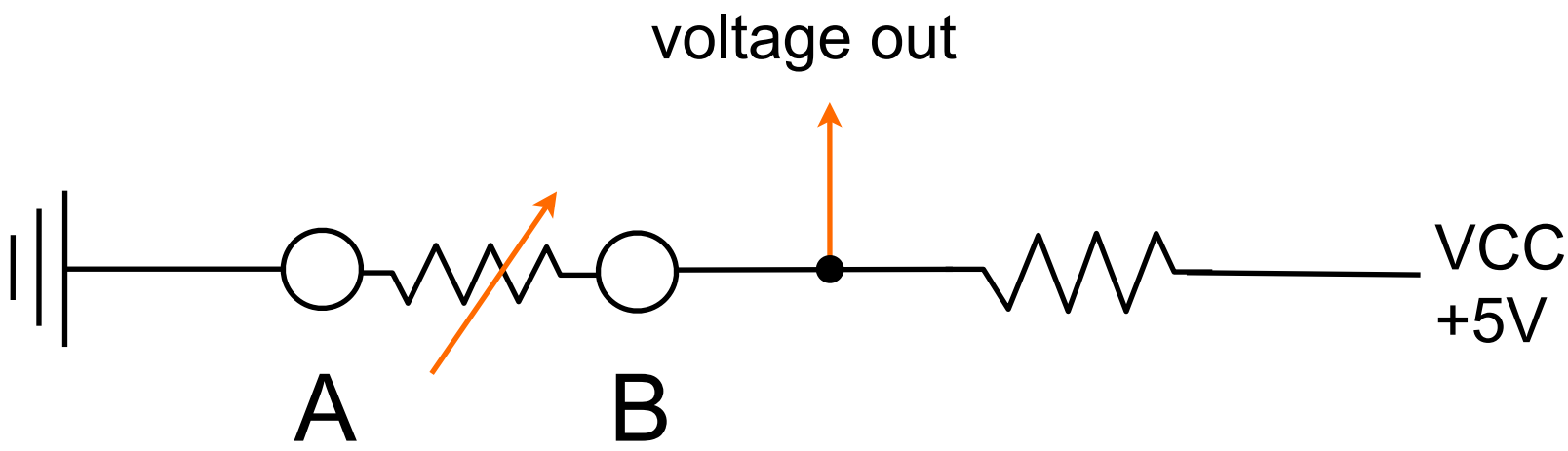


what is the resistance between point A and point B?

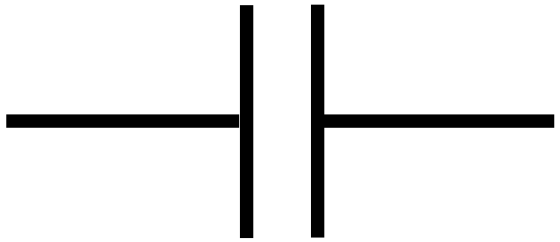
CAPACITIVE SENSORS

sensing change in
electrical charge

Capacitance

The ability of a capacitor to store energy

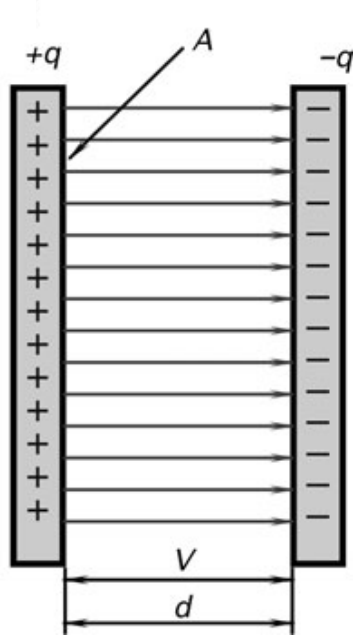
measured in Farads (1 Farad = 1coulomb/1Volt)



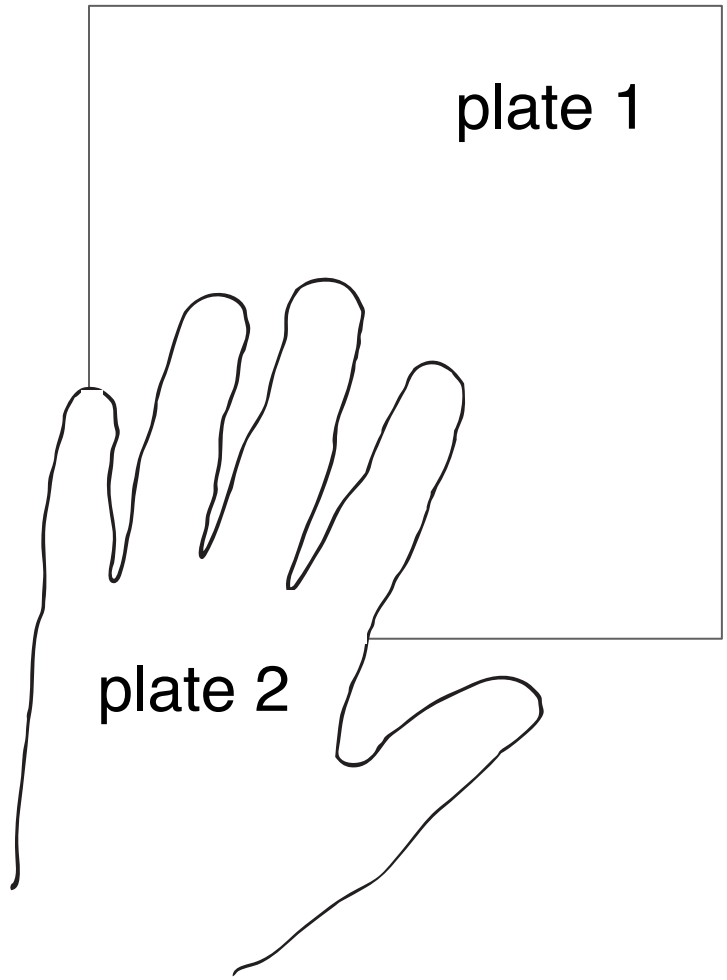
What is a capacitor?

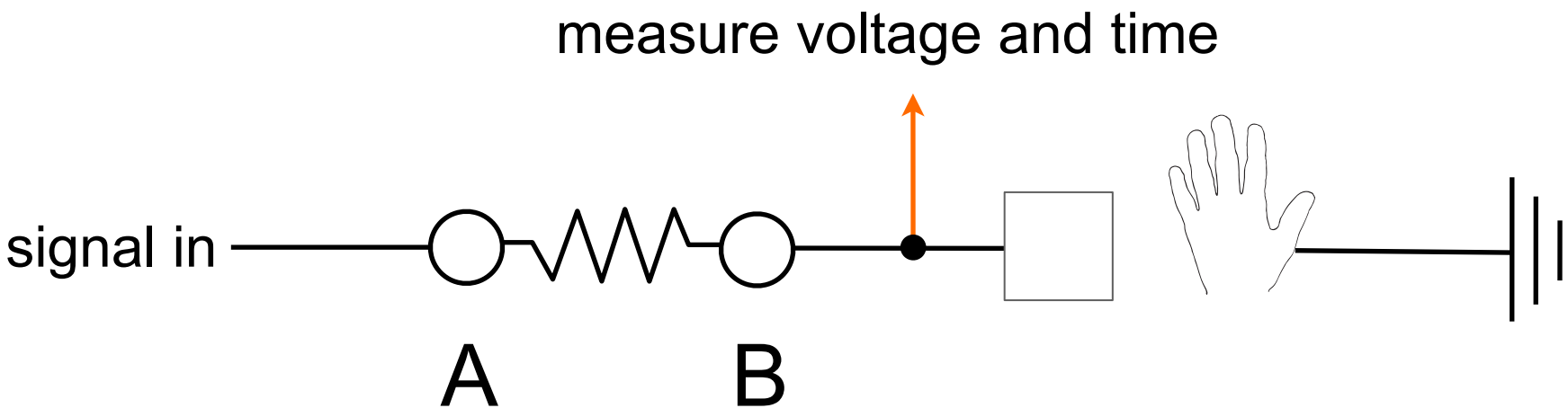
$$C = \frac{q}{V}$$

$$C = \frac{\varepsilon_0 A}{d}$$



Making a capacitive sensor





how much time does it take B to discharge?

for more on how this works see: http://en.wikipedia.org/wiki/RC_circuit

intro to Arduino w/ Dave & Sam

Thursday at 1pm in the HLT lab