

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

## Skill Sheet 7-A

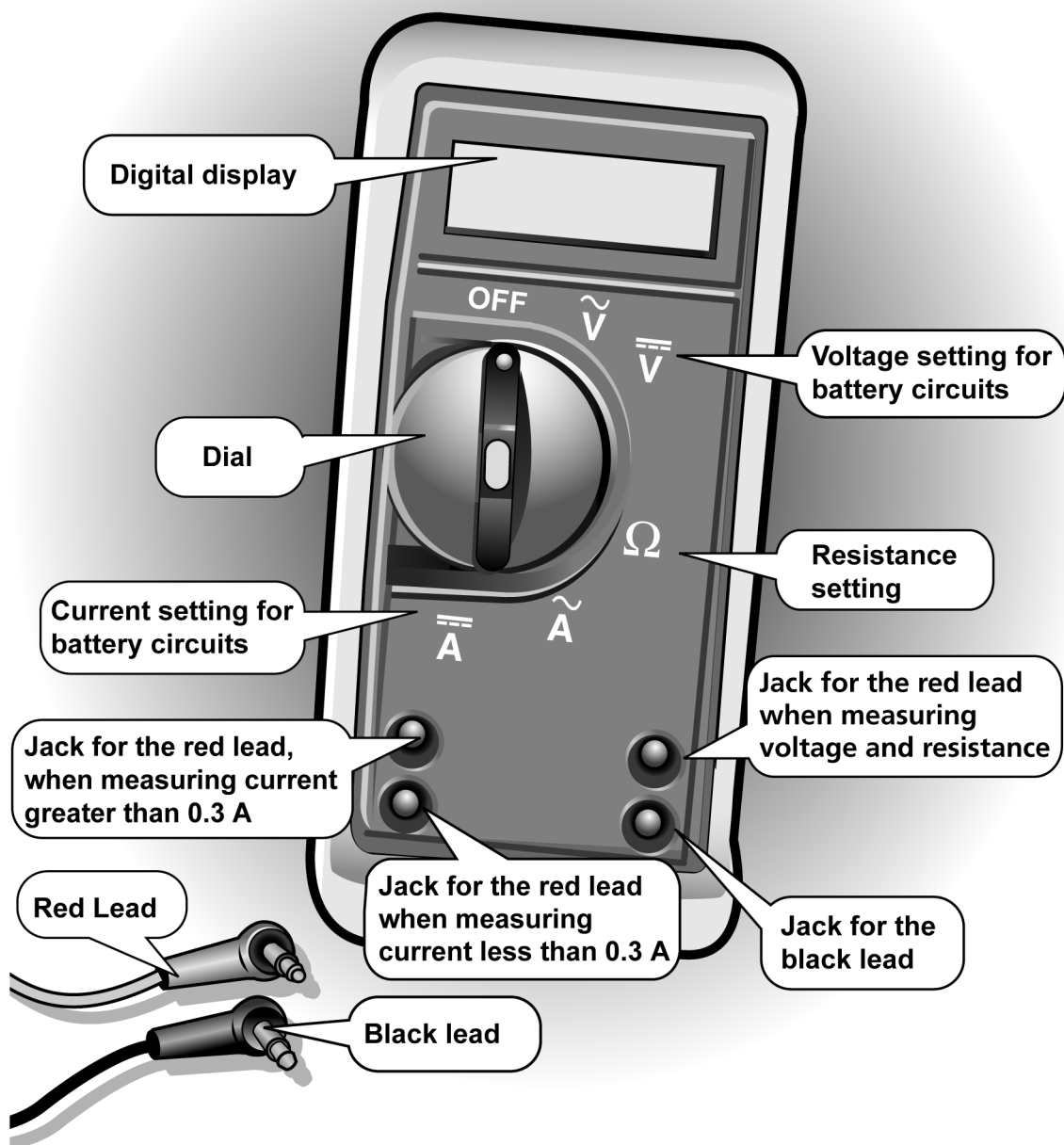
## Using an Electric Meter



What do you measure in a circuit and how do you measure it? This skill sheet gives you useful tips to help you use an electric meter and understand electrical measurements.

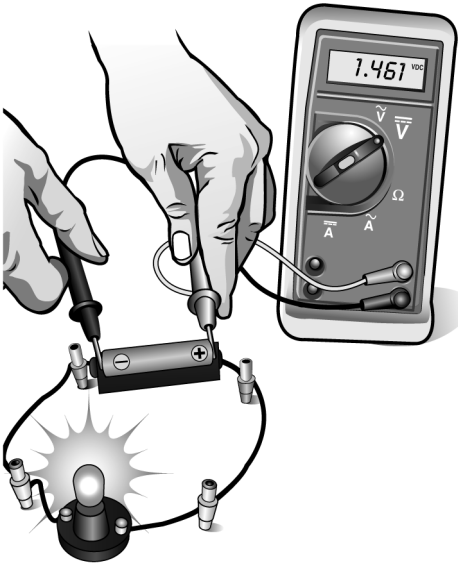
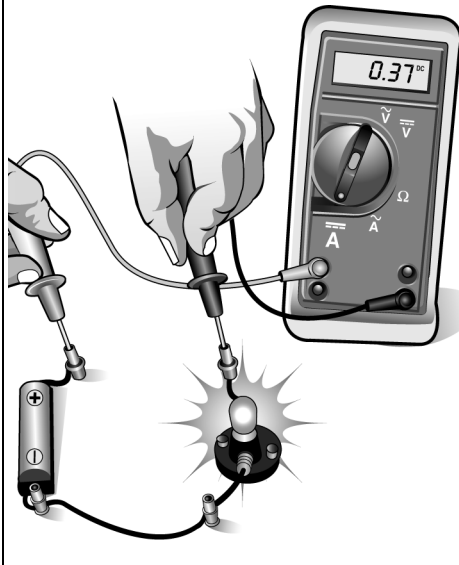
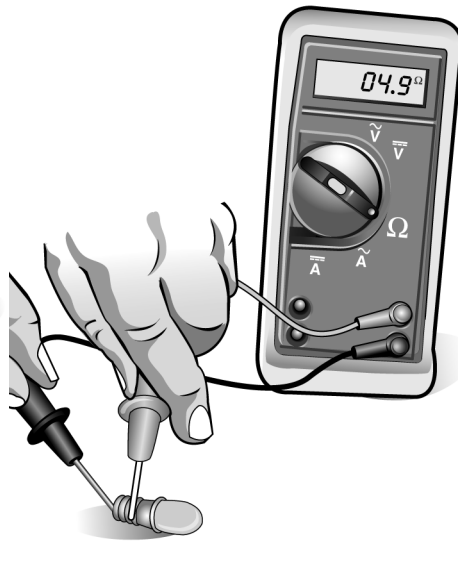
### 1. The digital multimeter

Most people who work with electric circuits use a *digital multimeter* to measure electrical quantities. These measurements help them analyze circuits. Most multimeters measure voltage, current, and resistance. A typical multimeter is shown below:



## 2. Using the digital multimeter

This table summarizes how to use and interpret any digital meter in a battery circuit. Note: A *component* is any part of a circuit, such as a battery, a bulb, or a wire.

Measuring Voltage	Measuring Current	Measuring Resistance
Circuit is ON	Circuit is ON	Circuit is OFF
Turn dial to voltage, labeled V, VDC, or $\overline{\overline{V}}$	Turn dial to current, labeled A, ADC, or $\overline{\overline{A}}$	Turn dial to resistance, labeled $\Omega$
Connect leads to meter following meter instructions	Connect leads to meter following meter instructions	Connect leads to meter following meter instructions
Place leads at each end of component (leads are ACROSS the component)	Break circuit and place leads on each side of the break (meter is IN the circuit)	Place leads at each end of component (leads are ACROSS the component)
Measurement in VOLTS (V)	Measurement in AMPS (A)	Measurement in OHMS ( $\Omega$ )
Battery measurement shows relative energy provided  Component measurement shows relative energy used by that component	Measurement shows the value of current at the point where meter is placed  Current is the flow of charge through the wire	Measurement shows the resistance of the component  When the resistance is too high, the display shows OL (overload) or $\infty$ (infinity)
		

### 3. Meter practice

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Build a series circuit with 2 batteries and 2 bulbs.

1. Measure and record the voltage across each battery:

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2. Measure and record the voltage across each bulb:

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3. Measure and record the voltage across both batteries:

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4. Draw a circuit diagram or sketch that shows all the posts in the circuit (posts are where wires and holders connect together).

5. Break the circuit at one post. Measure the current and record the value below. Repeat until you have measured the current at every post.

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6. Create a set of instructions on how to use the meter to do a task. Find someone unfamiliar with the meter. See if he or she can follow your instructions.

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7. A fuse breaks a circuit when current is too high. A fuse must be replaced when it breaks a circuit. Explain how measuring the resistance of a fuse can tell you if it is defective.

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8. You suspect that a wire is defective but can't see a break in it. Explain how measuring the resistance of the wire can tell you if it has a break.

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