CAIE Physics A-Level

Paper 3: Manipulation, Measurement and Observation

Flashcards

How is length measured with vernier callipers?

How is length measured with vernier callipers?

1. Align the calliper jaws with the object being measured.
2. Read the value off the main millimetre reading scale.
3. Read the value off the ‘tenth of a millimetre’ vernier scale where it lines up with the main scale.
4. Add the two values together to find the total length.

How is length measured with a micrometer?

How is length measured with a micrometer?

1. Align the micrometer jaws in place with the object.
2. Find the millimetre reading from the main barrel scale.
3. Find the ‘hundredth of a millimetre’ reading from the vernier scale where it lines up with the main scale.
4. Add the two values together to find the total length.

What is an anomalous result?

What is an anomalous result?

Anomalous results don't fit the pattern of the rest of the data and don't agree with repeat readings.

Why are repeat readings important?

Why are repeat readings important?

Taking repeat readings helps to identify anomalous results and allows mean values to be calculated.

What is precision?

What is precision?

How close a value is to the mean data value.

What is accuracy?

What is accuracy?

How close a measured value is to the true value.

How can the time period of an oscillating system be measured using a stopwatch?

How would you measure the time period of an oscillating system by using a stopwatch?

1. Time several consecutive oscillations.
2. Divide the total time by the number of wave cycles in that time. This method reduces uncertainty.

What is random error?

What is random error?

A random error is an error that is unpredictable and uncontrollable.

What is zero error?

What is zero error?

A zero error is when the measured value does not read zero when it should. It is a form of systematic error, as it results in the same error every time.

How can you reduce the likelihood of a zero error?

How can you reduce the likelihood of a zero error?

Ensure all measuring equipment is calibrated and properly zeroed before using it to take measurements.

How can you deal with random errors?

How can you deal with random errors?

Random errors normally occur as anomalous results which don't not fit the general data trend. They should be discarded when identified.

How should you decide the range of values you will take for your experiment?

How should you decide the range of values you will take for your experiment?

Use the largest possible range for measurements, within reasonable limits of method and equipment.

What's the difference between an analogue and a digital display?

What's the difference between an analogue and a digital display?

Analogue: the data is shown and recorded in its original form, typically on a dial

Digital: the data is converted into numbers and shown on a digital screen

What does this circuit diagram symbol represent?

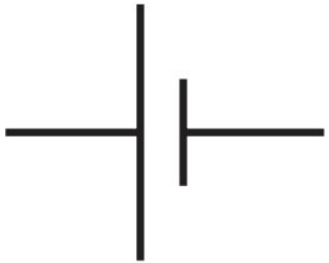

Photo taken from the CAIE specification

What does this circuit diagram symbols represent?

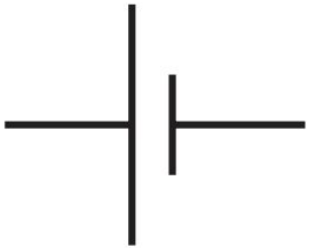

Photo taken from the
CAIE specification

A cell

What does this circuit diagram symbol represent?

Photo taken from the CAIE specification

What does this circuit diagram symbols represent?

Photo taken from the
CAIE specification

A switch

What do these circuit diagrams symbols represent?

or

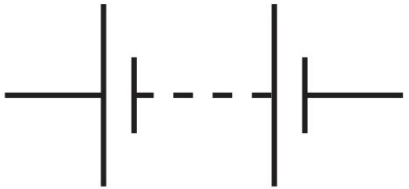

Photo taken from the CAIE specification

What do these circuit diagram symbols represent?

A battery of cells

or

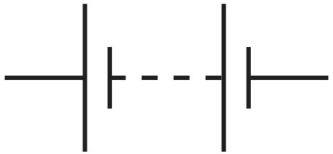

Photo taken from the CAIE specification

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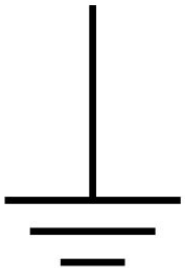

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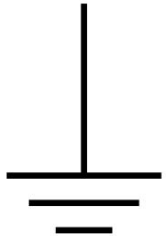


Photo taken from the
CAIE specification

Earth

What does this circuit diagram symbol represent?

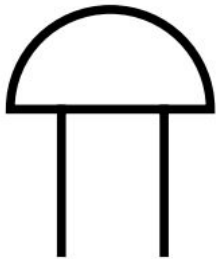
Photo taken from the CAIE specification

What does this circuit diagram symbol represent?

Photo taken from the
CAIE specification

A power supply

What does this circuit diagram symbol represent?



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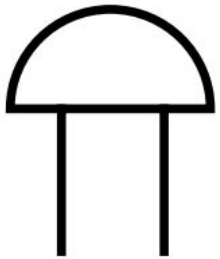

Photo taken from the
CAIE specification

An electric bell

What does this circuit diagram symbol represent?

Photo taken from the CAIE specification

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Photo taken from the
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An a.c. power supply

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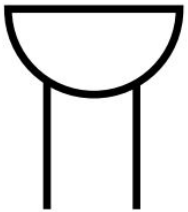

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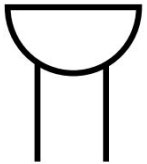

Photo taken from the
CAIE specification

A buzzer

What does this circuit diagram symbol represent?

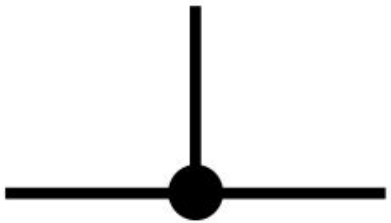

Photo taken from the CAIE specification

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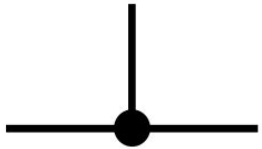
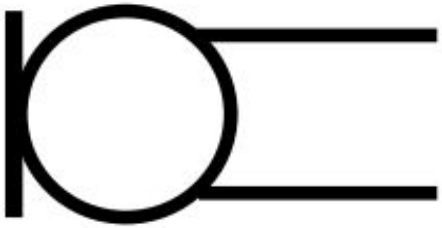


Photo taken from the
CAIE specification

A junction of conductors

What does this circuit diagram symbol represent?



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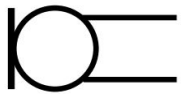

Photo taken from the
CAIE specification

A microphone

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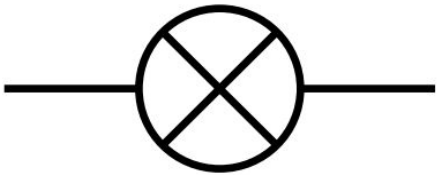


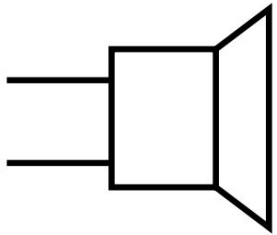
Photo taken from the CAIE specification

What does this circuit diagram symbol represent?

Photo taken from the
CAIE specification

A lamp

What does this circuit diagram symbol represent?



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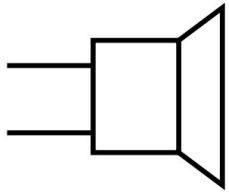

Photo taken from the
CAIE specification

A loudspeaker

What does this circuit diagram symbol represent?

Photo taken from the CAIE specification

What does this circuit diagram symbol represent?

Photo taken from the
CAIE specification

A fixed resistor

What does this circuit diagram symbol represent?

Photo taken from the CAIE specification

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A motor

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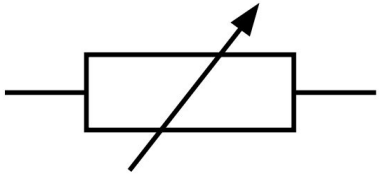

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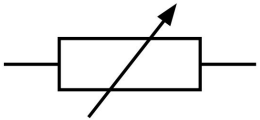


Photo taken from the
CAIE specification

A variable resistor

What does this circuit diagram symbol represent?

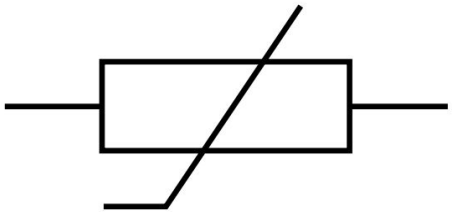
Photo taken from the CAIE specification

What does this circuit diagram symbol represent?

Photo taken from the
CAIE specification

A generator

What does this circuit diagram symbol represent?



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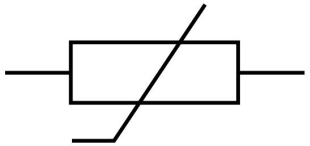
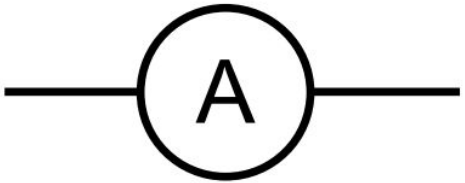


Photo taken from the
CAIE specification

A thermistor

What does this circuit diagram symbol represent?



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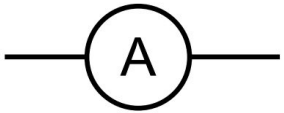

Photo taken from the
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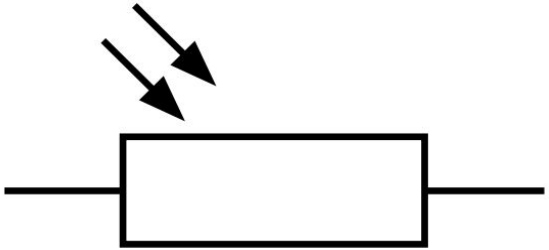
An ammeter

What does this circuit diagram symbol represent?



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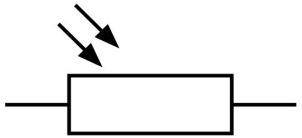
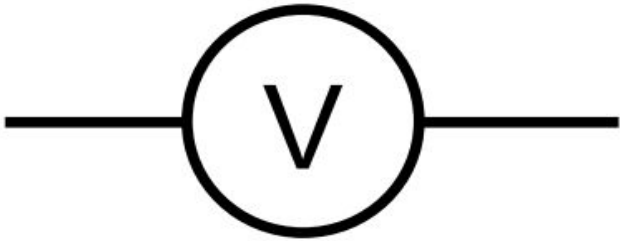


Photo taken from the
CAIE specification

A light-dependent resistor (LDR)

What does this circuit diagram symbol represent?



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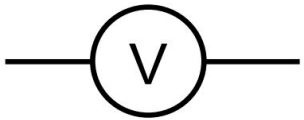


Photo taken from the
CAIE specification

A voltmeter

What does this circuit diagram symbol represent?

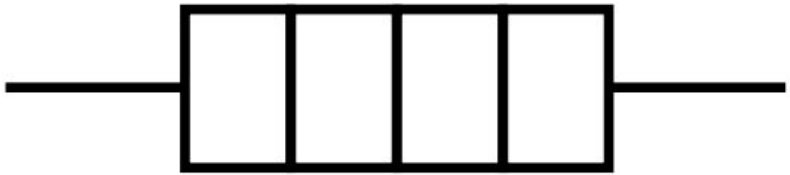


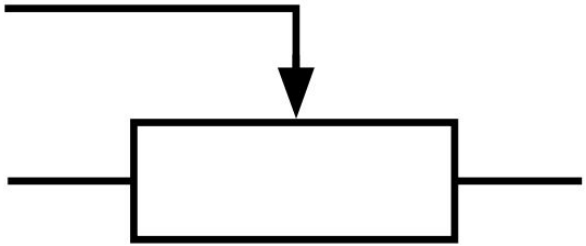
Photo taken from the CAIE specification

What does this circuit diagram symbol represent?

Photo taken from the
CAIE specification

A heater

What does this circuit diagram symbol represent?



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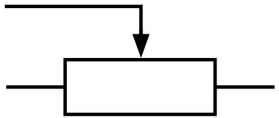

Photo taken from the
CAIE specification

A potentiometer

What does this circuit diagram symbol represent?

Photo taken from the CAIE specification

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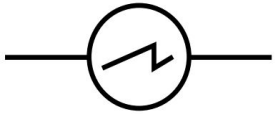
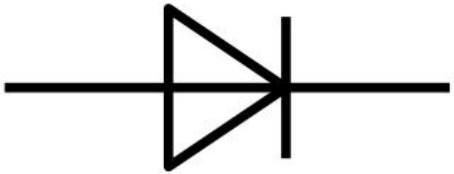


Photo taken from the
CAIE specification

An oscilloscope

What does this circuit diagram symbol represent?



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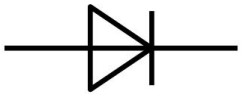
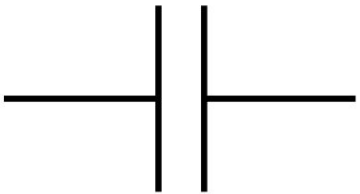


Photo taken from the
CAIE specification

A diode

What does this circuit diagram symbol represent?



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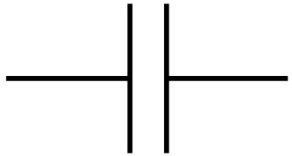

Photo taken from the
CAIE specification

A capacitor

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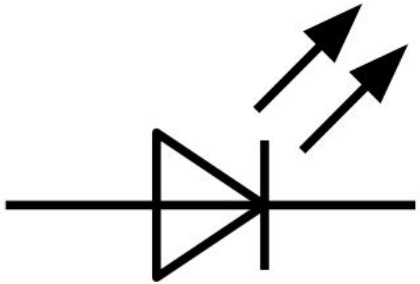

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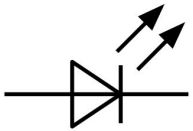

Photo taken from the
CAIE specification

A light-emitting diode (LED)