

## Systematic error card sort

Education in Chemistry

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[rsc.li/2JaSamI](http://rsc.li/2JaSamI)

A **systematic error** is one which causes the measurement to be wrong by the same amount each time. Systematic errors reduce the accuracy.

Using the statements in boxes below as cards, ask students to sort the cards to match each of the measurements you might take in a lab (**bold**) to each possible systematic error that can occur (underlined). Next, ask them to match the way in which the error could be eliminated (*italics*).

<b>Recording the mass of a solid on a balance.</b>	<u>Previous user spilt a small amount of solid on the balance pan.</u>	<i>Ensure the balance is clean before use or zero the balance each time.</i>
<b>Measuring out 25 cm<sup>3</sup> of acid using a measuring cylinder.</b>	<u>Reading taken from the top of the meniscus.</u>	<i>Bend down to eye level and read from the bottom of the meniscus.</i>
<b>Recording the temperature of a solution using an alcohol thermometer.</b>	<u>The alcohol thread is broken.</u>	<i>Replace the thermometer.</i>
<b>Determining the concentration of an unknown acid by titration against a standard solution of NaHCO<sub>3</sub>.</b>	<u>Too much water was added when making up the standard solution.</u>	<i>Remake the standard solution or titrate it against an acid of known concentration to determine its exact concentration.</i>
<b>Measuring the volume of CO<sub>2</sub> produced in the reaction between CaCO<sub>3</sub> and HCl by the displacement of water in an upturned measuring cylinder.</b>	<u>Some carbon dioxide dissolves in the water.</u>	<i>Use a gas syringe to measure the volume of gas produced.</i>