



Crystal Growing Competition
Watch your crystal grow

OLIPHANT SCIENCE AWARDS

CATEGORY: CRYSTAL GROWING

Supported by the SA Branch of the Royal Australian Chemical Institute
and
The RACI Chemical Education Group (S.A.)



LOG BOOK

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YEAR LEVEL: 12

SCHOOL: Unley High School

Please note: the use of this version of a log book is not mandatory.
There will be no penalty for not using it.

However the student(s) who are preparing a crystal will need to provide evidence of their ongoing efforts by comments related to the criteria suggested in this log book model.

The competition instructions suggest that the crystal growers formulate an hypothesis that they can test while growing the crystal(s)

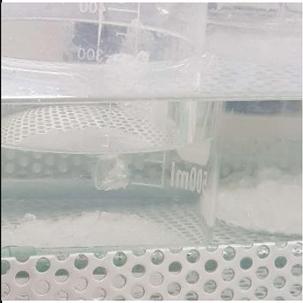
Examples of questions that could be expressed as a prediction or hypothesis are:

- Can my crystal grow to the required 9 mm in 3 weeks?
- Does leaving my crystal in a dark place help it to grow better?
- Does more or less attention help my crystal to be clearer and more well-formed?
- Does an incubator help grow bigger crystals in a given time period?

MY HYPOTHESIS Can crystals grow well in 11 weeks when placed in an incubator set at 25°C? _____

The logbook in this form is only advisory but students should try to document the following:

- Date and time for each handling of the crystal procedure
- Describe exactly what they did on each occasion (should include measurements of volume and temperature made at any time)
- What has happened to the selected crystal on each viewing (changes)
- Description of the crystal characteristics – clarity, regularity (smooth faces, sharp edges), and size (can be assisted by sketches or digital photos)
- What problems were encountered and how they were solved – may include summaries of discussions with teachers/mentors
- Acknowledgment of manual assistance by others e.g. for competitors from the R-2, 3-5 age groups, what teachers or parents did.
- Acknowledgement of any crystal growing advice from books or websites.

Date/Time	Descriptions of what the student(s) did, problems encountered and solved	Crystal characteristics	signed
3/06/2021	200ml of distilled water was poured into a beaker. The water was then boiled using a heat plate. Using a thermometer, the water temperature was recorded. Once it reached 60 degree the hot plate was turned off and 30g of aluminum potassium sulfate. Once the solution had cooled down to 25°C, a string attached to a popsicle was placed on top of the beaker. The beaker was then carefully placed into the incubator at 25°C. The location of the incubator was ensured to be the closer to the windowsill to receive better sunlight. A filter paper used to prevent any external pollutants such as dust from entering the beaker.	N/A	
10/06/2021	When the beaker was removed from the incubator, numerous crystals had already started forming at the bottom. The string had many crystals, small, grown on it. A good crystal with sharp edges, were picked using a tweezer and the rest was placed back in the beaker. Using a filter paper on a funnel, the solution was filtered. The good crystal on the string was gently lowered into the beaker. The beaker was placed back into the incubator at 25°C.	Numerous tiny crystals. Not formed but shiny. Each approximately around 2mm	
17/06/2021	To avoid contamination, the string with the crystal was carefully removed from the beaker and placed on a filter paper and covered with another filter paper. A new beaker was washed with distilled water, and the solution was filtered into it. The crystal was once again submerged into the solution. The beaker was then placed into the incubator at 25°C.	Edges looked sharper than before and more defined. Crystal grew to be at 10mm	
24/06/2021	The beaker was taken out of the incubator without disturbing the crystals. The filtered solution was poured in a new beaker, which was washed using distilled water. Crystals other than the good one, was removed from the string using a tweezer. The beaker was placed back into the beaker	Sharper edges and more clarity. The crystal is around 17mm  Figure 1. Crystal on a string, beaker placed in the incubator	

1/07/2021	The same steps of filtration were conducted. Some more crystals needed to be removed from the string. The beaker was placed back into the incubator. The solution was observed after taking it from the incubator, it appeared a little cloudy. The solution was filtered twice, and some new solution was added to increase the quantity. Crystal was carefully investigated using a magnifying glass for any defects. The crystal was put back into the beaker and then placed into the incubator.	The shape is more defined. No visible cracks. The crystal is 25.5 mm	
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Date/Time	Descriptions of what the student(s) did, problems encountered and solved	Crystal characteristics	signed
08/07/2021 School Holiday	The beaker was placed in the incubator without filtering		
15/07/2021 School Holiday	The beaker was placed in the incubator without filtering		
19/07/2021	There were small particles at the top of the beaker. The solution was filtered twice, however, it still seemed cloudy, so it was discarded, and a new solution was made. The crystals were again investigated; however, they did not look damage. A new beaker was washed thoroughly in distilled water to pour the new solution in and to grow the crystal	<p>Much larger than before. Edges have become more defined. No visible damage. The crystal is 50mm</p>  <p>Figure 2. Investigating crystal for any damage</p>	
22/07/2021 Lockdown	The beaker was placed in the beaker without filtering		
5/08/2021	The solution appeared clearer than last week; it was filtered as usual. The crystal was once again checked for its quality. Once the solution was filtered, the crystal was carefully placed into the beaker. The beaker was then placed back in the incubator.	The crystal was about 63 mm with sharp edges and clarity.	
12/08/2021	The solution appeared clear, and the crystal seemed to be a good size. The solution was carefully moved out of the incubator to avoid damaging the crystal. A new beaker and funnel were washed with distilled water. The filtered solution was poured into the new beaker. The crystal had sharp edges and grown to be 70mm. The crystal was careful removed from the string after investigating for any issues. As the crystal seemed to be in good condition, it was placed into a Ziplock bag.	The edges are defined and sharp. Good overall shape 70mm in size	

	<p>Conclusion: -</p> <p>The investigation showed that crystals incubated at 25 °c can grow well and increase in size overtime. The crystal has good clarity and sharp edges, it has also grown to 70mm over the course of 11 weeks.</p>		
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