



**Prize Winner**

# **Crystal Investigation**

## **Year 7-8**

**UMAR MATEEN**

**Unley High School**





# 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.)



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**YEAR LEVEL:** 7      **SCHOOL:** Unley High School

Please note: the use of this version of a logbook 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 logbook model.

The competition instructions suggest that the crystal growers formulate a 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?



THE HYPOTHESIS: It is hypothesised that the crystal will grow to the required nine millimetres in three weeks.


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

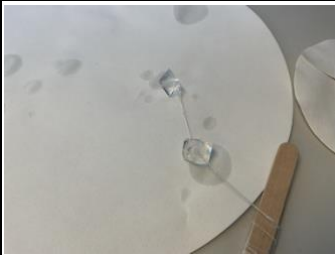
- Date and time for each handling of the crystal procedure
- Describe exactly what they did on each occasion (should include measurements of volume and temperature made at any time)
- What has happened to the selected crystal on each viewing (changes)
- Description of the crystal characteristics – clarity, 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
17-05-23 Wednesday	<ul style="list-style-type: none"> <li>- Attach seed crystal to thread with adhesive and place on filter paper to dry. While that dries, wash funnel and beaker in distilled water ready to be used. Fold filter paper, and place it inside the funnel, which now lies on the beaker. Pour the alum crystal solution into the funnel until full and repeat until the solution comes halfway up the beaker. Tie the thread attached to the seed crystal to a pop stick. Cut filter paper through to the centre and put the pop stick inside the cut. Place that filter paper on the beaker with the solution. Make sure that the crystal is fully submerged in the solution. If not add solution until it is. Put the beaker with the crystal inside into the water bath and make sure some sort of weight is applied to the filter paper, so it does not fly away. Clean all tools used with distilled water, and clean bench.</li> </ul>	<ul style="list-style-type: none"> <li>- Small seed crystal attached to thread. Good clarity and neat cuts.</li> </ul>	
24-05-23 Wednesday	ABSENT	Not Available	
31-05-23 Wednesday	<ul style="list-style-type: none"> <li>- Wash funnel, spoon, and beaker in distilled water ready to be used. Fold filter paper and place it inside the funnel, which now lies on the beaker. Grab the beaker with the crystal. Take the crystal out of the beaker and put on another sheet of filter paper on the bench. Pour the solution in the beaker which had the crystal into the funnel until it is full. Wait for that wait for that to be filtered. Repeat process until no more solution left in the old beaker. Take filter paper out of the funnel and throw that away. Use spoon to break crystals that formed on the bottom of the old beaker and spoon them into the new beaker. Put the crystal into the new beaker and make sure the crystal is fully submerged onto the solution. If the crystal is not fully submerged, add more solution until it is. Put the</li> </ul>	<ul style="list-style-type: none"> <li>- Observations that were made include the bottom crystal having great clarity and cuts.</li> <li>- The top crystal had slight amounts of overgrowth on it.</li> </ul> 	

	<p>beaker with the crystal inside it into the water bath and make sure some sort of weight is applied to the filter paper on which the pop stick the crystal is attached. This is so it does not fly away. Clean all tools that were used with distilled water and clean bench.</p>		
07-06-23 Wednesday	ABSENT	Not Available	
14-06-23 Wednesday	<ul style="list-style-type: none"> <li>- Wash funnel, spoon, and beaker in distilled water ready to be used. Fold filter paper and place it inside the funnel, which now lies on the beaker. Grab the beaker with the crystal. Take the crystal out of the beaker and put on another sheet of filter paper on the bench. Pour the solution in the beaker which had the crystal into the funnel until it is full. Wait for that wait for that to be filtered. Repeat process until no more solution left in the old beaker. Take filter paper out of the funnel and throw that away. Use spoon to break crystals that formed on the bottom of the old beaker and spoon them into the new beaker. Put the crystal into the new beaker and make sure the crystal is fully submerged onto the solution. If the crystal is not fully submerged, add more solution until it is. Put the beaker with the crystal inside it into the water bath and make sure some sort of weight is applied to the filter paper on which the pop stick the crystal is attached. This is so it does not fly away. Clean all tools that were used with distilled water and clean bench.</li> </ul>	<ul style="list-style-type: none"> <li>- Observations made include the bottom crystal with great clarity and cuts on the outside. However, there was some cloudiness in the centre.</li> <li>- Top crystal had a chip in it and a cloudy centre.</li> </ul> 	
21-06-23 Wednesday	<ul style="list-style-type: none"> <li>- Wash funnel, spoon, and beaker in distilled water ready to be used. Fold filter paper and place it inside the funnel, which now lies on the beaker. Grab the beaker with the crystal. Take the crystal out of the beaker and put on another sheet of filter paper on the bench. Pour the</li> </ul>	<ul style="list-style-type: none"> <li>- Bottom crystal had good clarity and cuts. It still had some windy edges and a small cloud of white in the centre.</li> </ul>	

	<p>solution in the beaker which had the crystal into the funnel until it is full. Wait for that wait for that to be filtered. Repeat process until no more solution left in the old beaker. Take filter paper out of the funnel and throw that away. Use spoon to break crystals that formed on the bottom of the old beaker and spoon them into the new beaker. Put the crystal into the new beaker and make sure the crystal is fully submerged onto the solution. If the crystal is not fully submerged, add more solution until it is. Put the beaker with the crystal inside it into the water bath and make sure some sort of weight is applied to the filter paper on which the pop stick the crystal is attached. This is so it does not fly away. Clean all tools that were used with distilled water and clean bench.</p>	<ul style="list-style-type: none"> <li>- Top crystal had overgrowths, a chip in it and a slightly cloudy centre. It looked like only the bottom crystal would be sent.</li> </ul> 	
29-06-23 Thursday	<ul style="list-style-type: none"> <li>- Wash funnel, spoon, and beaker in distilled water ready to be used. Fold filter paper and place it inside the funnel, which now lies on the beaker. Grab the beaker with the crystal. Take the crystal out of the beaker and put on another sheet of filter paper on the bench. Pour the solution in the beaker which had the crystal into the funnel until it is full. Wait for that wait for that to be filtered. Repeat process until no more solution left in the old beaker. Take filter paper out of the funnel and throw that away. Use spoon to break crystals that formed on the bottom of the old beaker and spoon them into the new beaker. Put the crystal into the new beaker and make sure the crystal is fully submerged onto the solution. If the crystal is not fully submerged, add more solution until it is. Put the beaker with the crystal inside it into the water bath and make sure some sort of weight is applied to the filter paper on which the pop stick the crystal is attached. This is so it does not fly away. Clean all tools that</li> </ul>	<ul style="list-style-type: none"> <li>- The picture quality was not the best for this. Both crystals had good edges and clarity. However, the chip on the top crystal made it look worse. Thus, the top crystal would unlikely be sent.</li> </ul> 	

	<p>were used with distilled water and clean bench.</p> <ul style="list-style-type: none"> <li>- Tiny crystals were forming on the thread that carried the crystals, so a tweezer was used to crush them. Once the thread was put back into the solution, the small crystals fell off.</li> </ul>		
05-07-23 Wednesday	ABSENT	Not Available	
12-07-23 Wednesday	SCHOOL HOLIDAYS	Not Available	
19-07-23 Wednesday	SCHOOL HOLIDAYS	Not Available	
26-07-23 Wednesday	<ul style="list-style-type: none"> <li>- Wash funnel, spoon, and beaker in distilled water ready to be used. Fold filter paper and place it inside the funnel, which now lies on the beaker. Grab the beaker with the crystal. Take the crystal out of the beaker and put on another sheet of filter paper on the bench. Pour the solution in the beaker which had the crystal into the funnel until it is full. Wait for that wait for that to be filtered. Repeat process until no more solution left in the old beaker. Take filter paper out of the funnel and throw that away. Use spoon to break crystals that formed on the bottom of the old beaker and spoon them into the new beaker. Put the crystal into the new beaker and make sure the crystal is fully submerged onto the solution. If the crystal is not fully submerged, add more solution until it is. Put the beaker with the crystal inside it into the water bath and make sure some sort of weight is applied to the filter paper on which the pop stick the crystal is attached. This is so it does not fly away. Clean all tools that were used with distilled water and clean bench.</li> <li>- The crystals that grew on the bottom of the beaker became too large and took too much space in the beaker. To fix this, some thread</li> </ul>	<ul style="list-style-type: none"> <li>- Observations showed that the bottom crystal had amazing cuts, looking just like a particular gem. The clarity was also good, although there was some cloudiness in the centre.</li> <li>- The top crystal would not be sent off, as all the cuts are just bad, and clarity is also not good on the crystal.</li> </ul>	

	<p>was wrapped around the pop stick to raise the bottom crystal from touching the other crystals on the bottom of the beaker. No extra solution was added, as there was no need to submerge the top crystal for it was inferior to anyone's standards and was not being sent off.</p>		
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This crystal investigation was not able to support the hypothesis, as none of the two crystals were able to reach nine millimetres by three weeks. The time they took to reach nine millimetres was four weeks, instead of three.