SASTA OLIPHANT SCIENCE AWARDS

SOUTH AUSTRALIAN SCIENCE TEACHERS ASSOCIATION

Highly Commended

Crystal Investigation

Year 3-4

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App code: 7417381

Year Level: 3 - 4 **Group Entry:** Y **Students:** 3

Category: Crystal Investigation

Project Title:

Crystal Star

20/6/20

10:00 am

Log Book

what are crystals?

- crystals are diamonds
- They are clear
- They are hard
- we grow crystals
- crystals are cold
- They have sharp edges
- They are solid

Definition

Crystals are a solid material where molecules join together in a highly ordered structu

How are they formed?

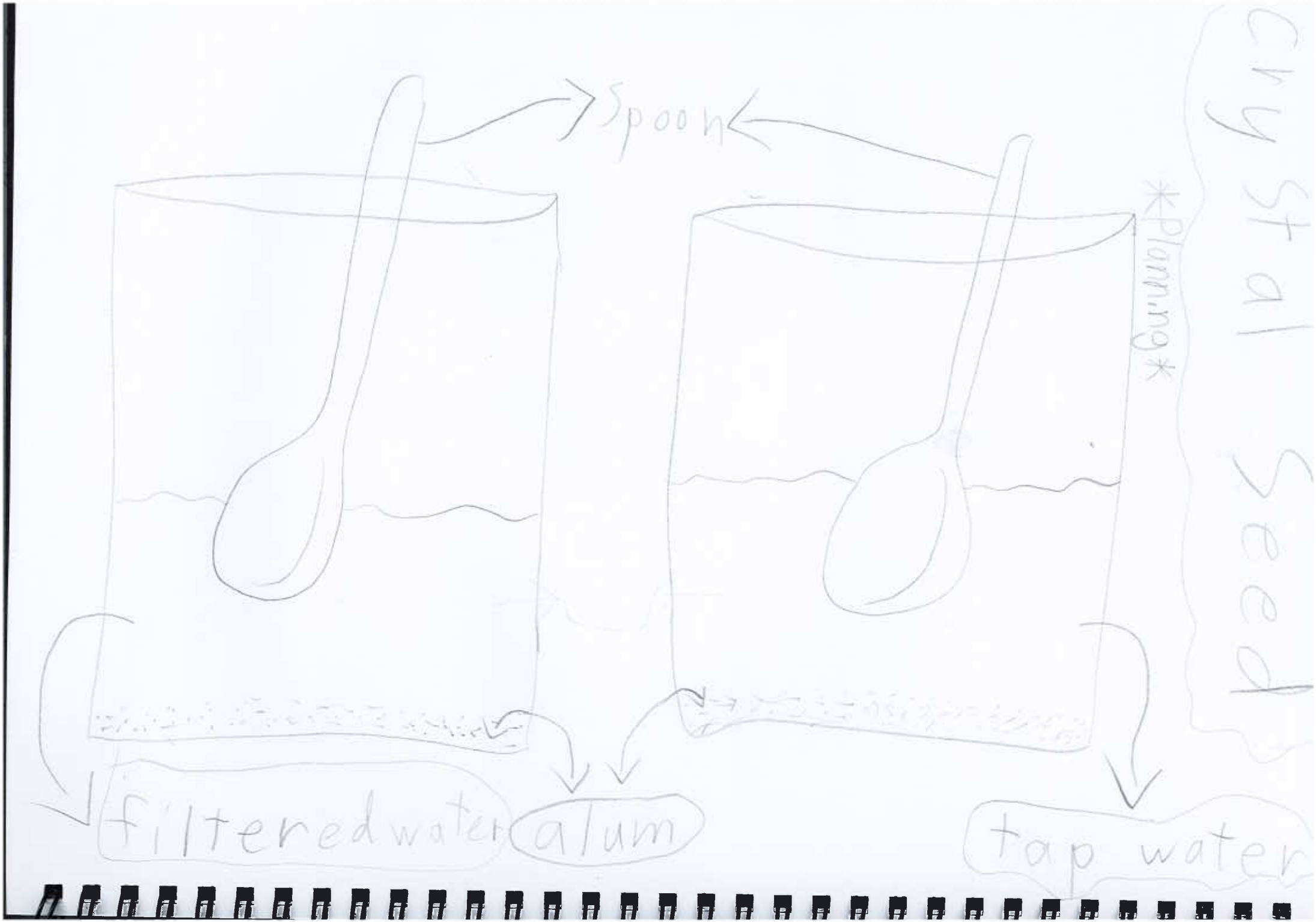
Solid into hot liquid
As it cools a crystal forms

rystallisation is the process of
rystal formation.

2016 10:00am

(Questions)

- light or dark places?
- fast or slow?
* tap water or filtered water?


spoon
spoon
crystal seed
filtered water
alum
tap water

Prediction

I think the filter water will grow the best crystals

Solutes and Solvents

← Solute

Alum

← Solvent

Spring water

Solvent

tap water

Hypotheses

We hypotheses that alum crystals will grow faster in spring water then tap water. This hypotheses is based on the assumption that tap water may contain other solutes that may interfere with the crystals growing process.

Controlled variables

- all grown in the same temperature
- Window seel
- all started with the same amount of alum and water, 1 1/2 teaspoons per half cup of water
- all same size jars
- All left for the same amount of time.

Our Responding Variables

Temperature of solvent - hot 50°
r boiled 100°

Type of Solvent - 'spring' or 'tap' water

Final Samples:

4. spring - 50° hot
3. spring - 100° boiled
. Tap - 50° hot
Tap - 100° boiled

Equipment

- 1 cup of boiled 100° spring w
- 1 cup of hot 50° spring wa
- 1 cup of boiled 100° tap wate
- 1 cup of hot 50° tap water
- 4 jars
- Thermometer
- 3 teaspoons of alum per jar
- teaspoon measure
- mixing spoons
- nylon fishing line
- pencils per jar

Method

1. Label the jars
2. Heat the water on the stove to the desired temperature using the thermometer
3. measure out the alum using the teaspoons
4. Stir the alum into the water until it dissolves
5. Pour the water into the jars using the filter paper to get rid of any leftover particals.
6. Cover the jars with filter paper
7. Place jars in a warm place where they will not be agitated
8. monitor and wait for the crystals to grow.

2016
10:15am

made new samples with boiling water-
why? we found out that boiling
up wasn't 'filtered' water! Boiling
water removes bacteria and
other organisms. However, it can
still contain other pollutants like
chlorine, lead.

- Had to remove jar lids
and cover with filter paper-
why! water wasn't evaporating

- Had to change to wider, clear
glass jars - why? it was hard to see
if the crystals had formed in the
bubbly glass and some crystals
started forming together

- Had to add more alum
1½ tsp why? the solution wasn't
saturated enough
crystals melted - why? too cold on the window
sect at night

20/6
10:30am

21/6 8:00am

Findings

A. spring water (boiled 100°)

After 24 hours

Lots of little crystals

(wed 24th June 5:14pm)

B. spring water (hot 50°)

wed 24th June 5:14 pm

3 single crystal

c. Tap (boiled 50°)

crystals joined together

(Mon 29th June. 3:40pm)

b. tap water (hot 50°)

Sat 27th June. 3:40pm

line of crystal

Growing the crystal seed

method:

1. Choose best crystal seed

2. Tie the nylon fishing line around it.

3. Attach the other end to the pop stick/pencil

4. Position the popstick so the string is hanging in the middle of the jar in the liquid

5. Monitor - if it dissolves = add more alum - if other crystals form = new jar

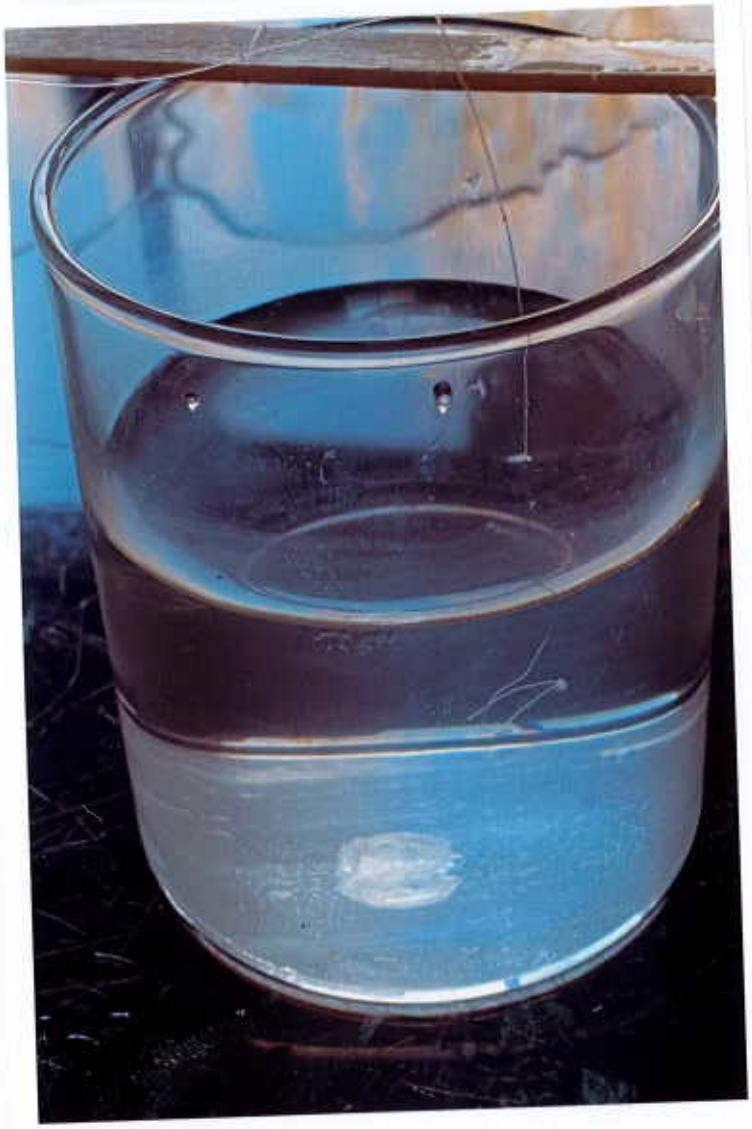
6. When it is grown as large as it can, carefully remove it let it dry on some paper towel.

Sun 5th June

11:00 am

problems

- super glue did not work - left white film of glue
- Tying the knot it kept coming undone!!
- The crystal started to dissolve - too hot in sun, not enough alum
- Other crystals started to form in that jar



← crystal kept falling off

Monday 6th

June 8:00 am

Findings:

The Spring water produced the
est formed crystal

Temperature of Solvent

f you want to grow quickly many
ittle crystals boil the water
f you want to grow a nice
ig seed just make it hot

why?

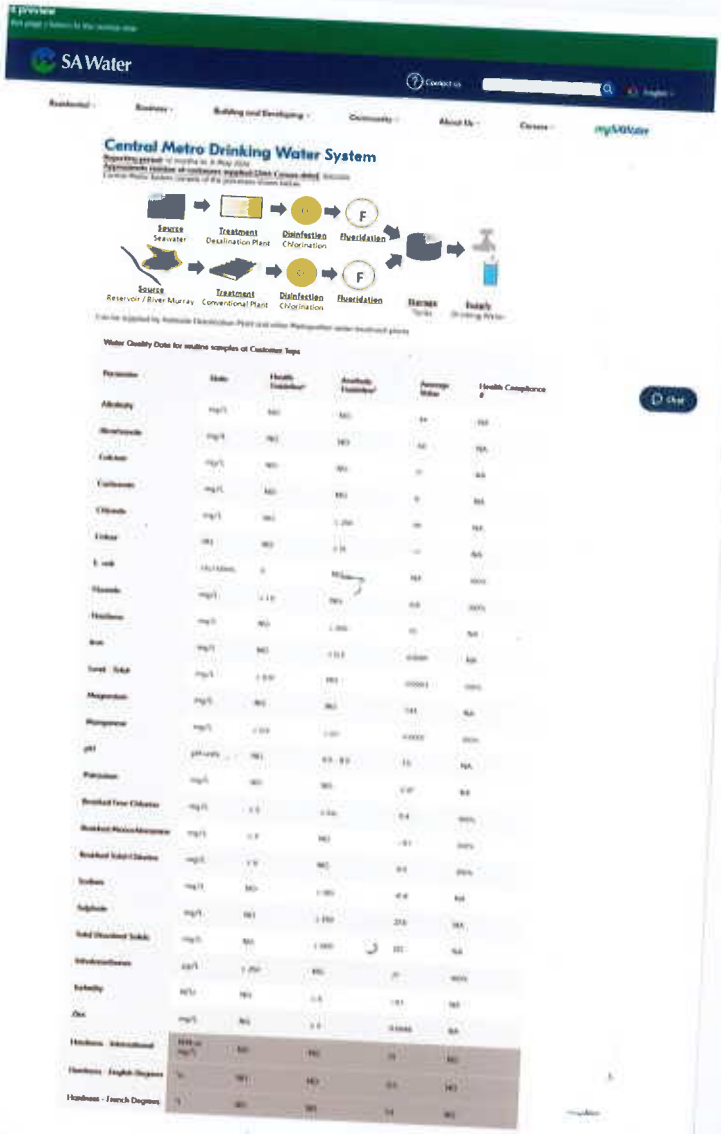
he hotter the water the more
aturated the solution can get
he faster they grow, crystals
ay start to form before the
quid has completely cooled

{type of solvent}

If you want to grow crystals faster use spring water.

why?

Tap water may contain other solvents that slow down the process.



Possible Errors:

- The Solution may have been agitated while it was forming
- the crystal got knocked when it fell off the string.

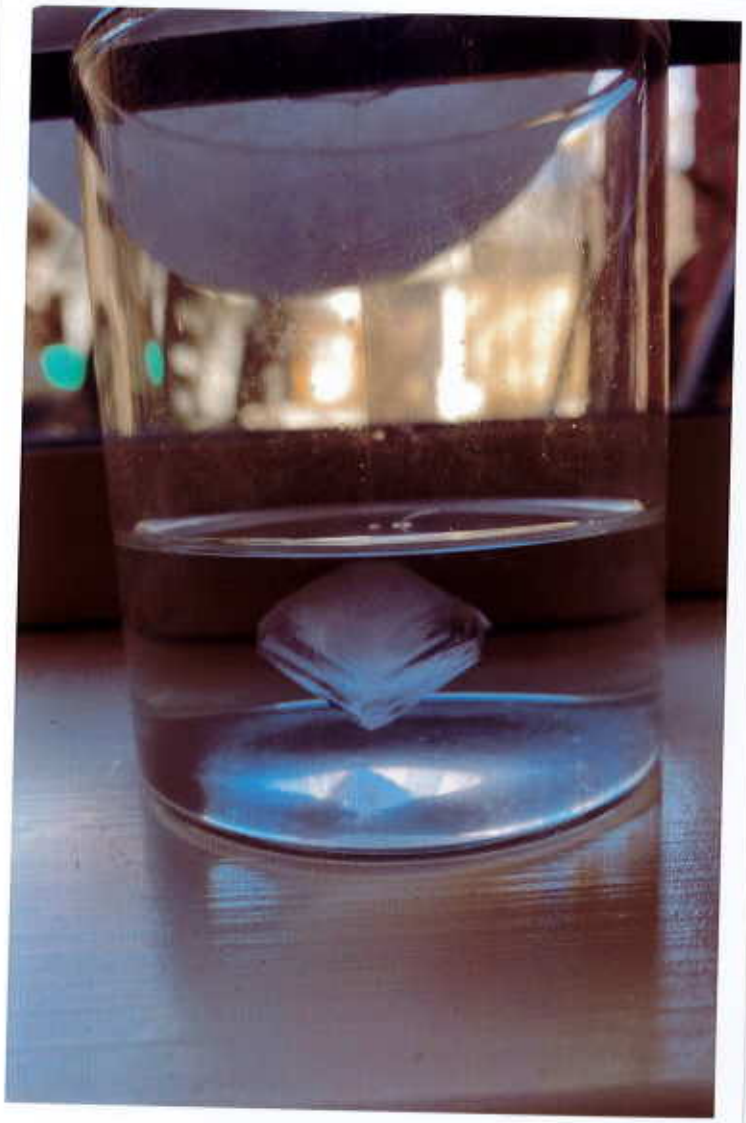
Improvements:

- Always use hot water
- Grow them in summer when there is sun
- See problems - how we fixed them

Adult help:

helped tie knots

hypothesis was correct. The crystals grew faster in spring water. The tap water had other things in it that interfered with the growth of the crystals.



16th August 4:00 pm 1 Final crystals 2