



# Sec 1 Academic Talk (Science)

5 Jan 2018

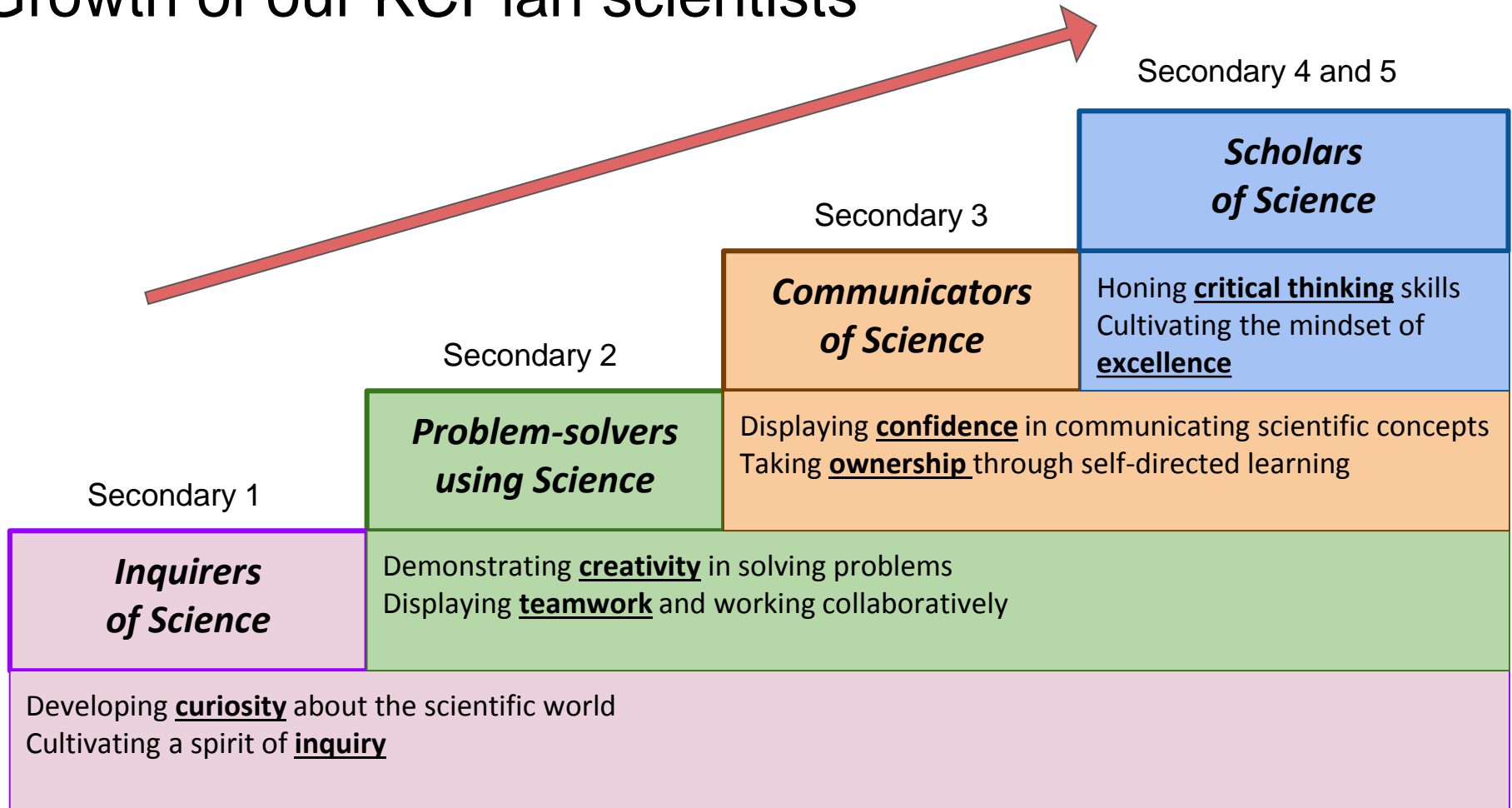


# Overview

- ❖ Growth of our KCPian Scientists
- ❖ Our Curriculum and Programmes
- ❖ Approach
- ❖ Support from parents



# Growth of our KCPian scientists



# Science Curriculum

## Taught Curriculum

- Sec 1 & 2 : Lower Secondary General Science
- Sec 3/4 Express : Pure Sciences (P/B/C) and Combined Sciences (P/C & B/C)
- Sec 3/4/5 Normal Academic Combined Sciences (P/C & B/C)

## Experienced Curriculum

- STAR Programme
- ExCite Programme



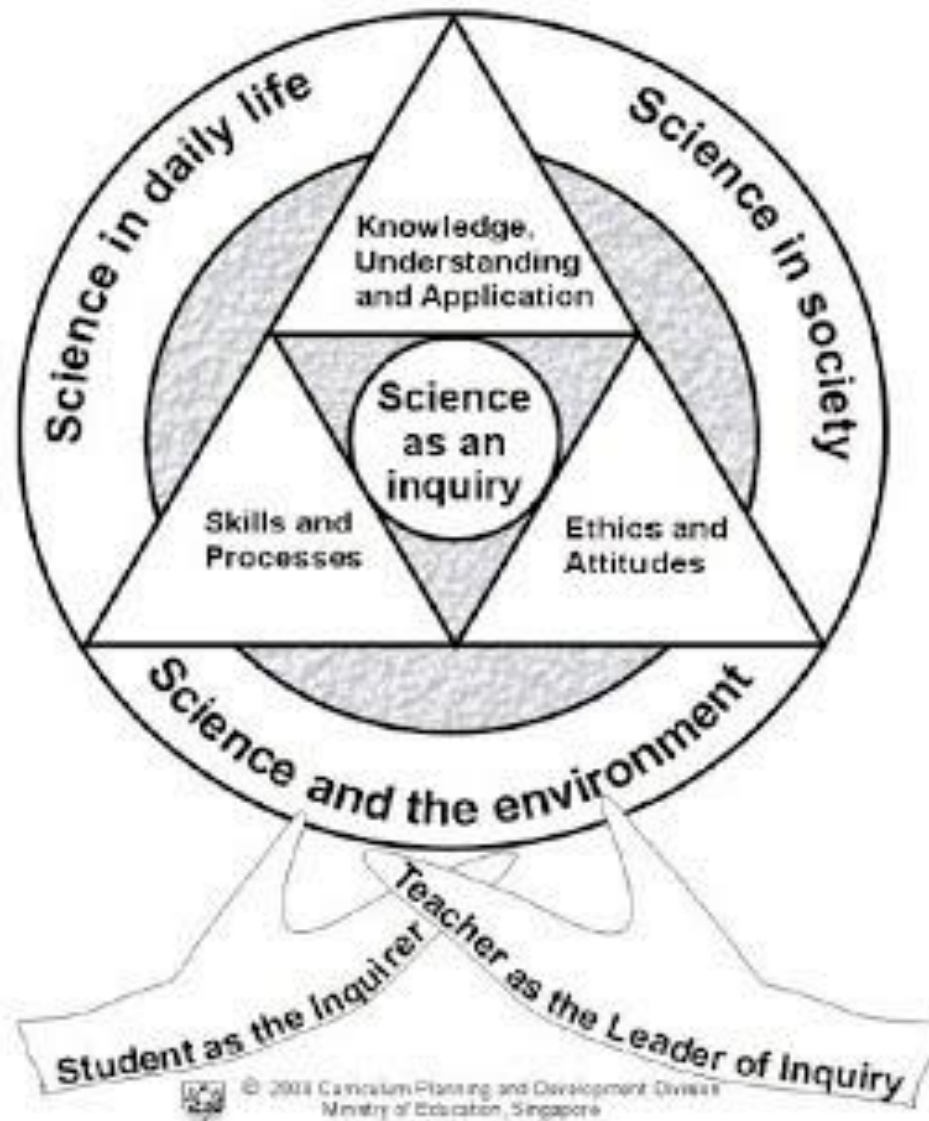


# Our Approach

# Engage, Empower, Excite

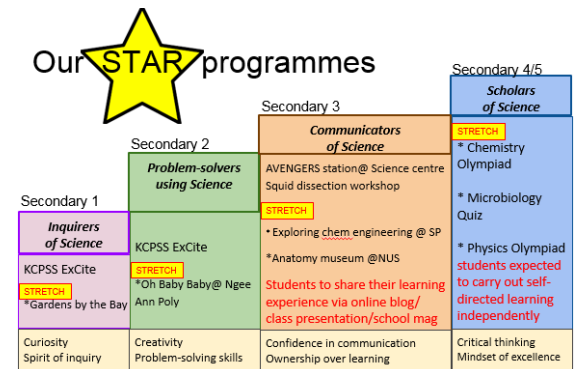
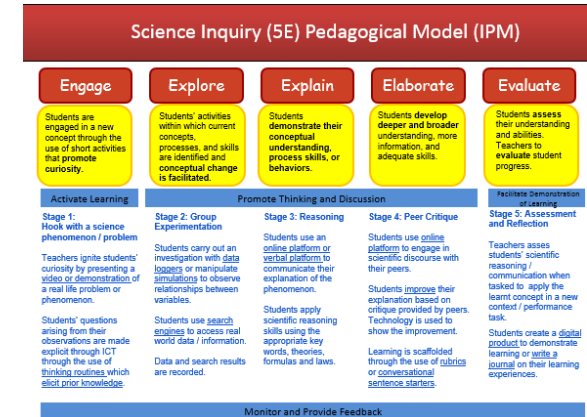


# MOE Science Curriculum



# The Journey of Engagement

- Inquiry Based Learning
- Experiential Learning
- Problem Based Learning



# Excite our KCPians

- LSS ExCite Programme
- A Problem-Based Learning Approach





**Table 1: Overview of Lower Secondary Science Express/Normal (Academic) Syllabus**

Designed for 85% of the curriculum time. <sup>2</sup>		White Space
<b>1. The Scientific Endeavour</b>		The 15% freed up curriculum time is to enable teachers to use more engaging teaching and learning approaches, and/or to implement customised school-based programmes as long as the aims of the syllabus are met. This enables teachers to make learning more meaningful and enjoyable for their students.
<b>Themes</b>	<b>Topics</b>	
<b>Diversity</b>	2. Exploring Diversity of Matter by their Physical Properties 3. Exploring Diversity of Matter by its Chemical Composition 4. Exploring Diversity of Matter Using Separation Techniques 5. Understanding Diversity of Living Things	
<b>Models</b>	6. Model of Cells – the Basic Units of Life 7. Model of Matter - The Particulate Nature of Matter 8. Model of Matter - Atoms and Molecules 9. Ray Model of Light	
<b>Systems</b>	10. Transport System in Living Things 11. Human Digestive System 12. Human Sexual Reproductive System 13. Electrical Systems	
<b>Interactions</b>	14. Interactions through the application of forces 15. Energy and Work Done 16. Transfer of Sound Energy through Vibrations 17. Effects of Heat & its Transmission 18. Chemical Changes 19. Interactions within Ecosystems	

# Secondary 1 ExCite Programme

# Objectives of Sec 1 ExCite Programme

## Science and Geography Collaboration

- engage KCPians to learn Science through **creative problem-solving of real world context**
- challenge KCPians cognitively through **collaborative learning and teamwork**
- develop KCPians in their **scientific skills and processes**

# Science Assessment

Sec 1 Express / Normal Academic

Semester 1 (40%)		Semester 2 (60%)	
CA1 (15%)	SA1 (25%)	CA2 (15%)	SA2 (45%)
<u>Test (15%)</u> Test 1 – 25 m Test 2 – 25 m Test 3 – 25 m	Mid-Year Exam (2h paper)	<u>Tests (10%)</u> Test 4 – 25 m Test 5 – 25 m  <u>Alternative Assessment (5%)</u> EXCITE PROGRAMME	End-Of-Year Exam (2h paper)



# Over 4 weeks....

Action by Students	Skills / Attitudes Acquired
Given an open-ended problem to solve	Critical and inventive thinking
Working in groups of 3-4	Collaboration and communication skills
Documenting their research on an online site	Media literacy and information processing skills

# What they will assessed on:

## 1. Group website (eg Wordpress/ Blogger/ Google sites/ Wix)

KWL [20%]

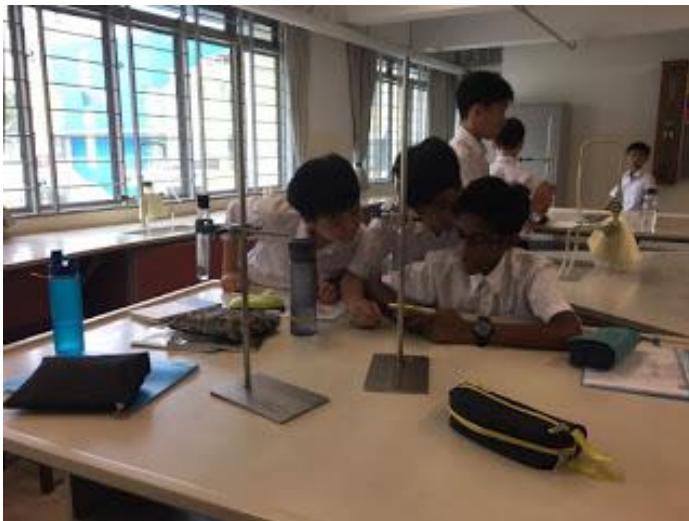
Documentation of research [30%]

Individual reflection on learning points [10%]

## 2. Peer assessment [10%]

## 3. Final Product [30%]

# Students in action!



# Documentation of Research



Aftermath of the black ink dissolved in water



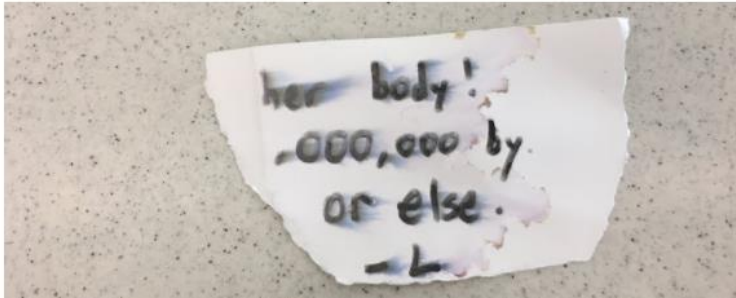
Aftermath of the black ink dissolved in ethanol



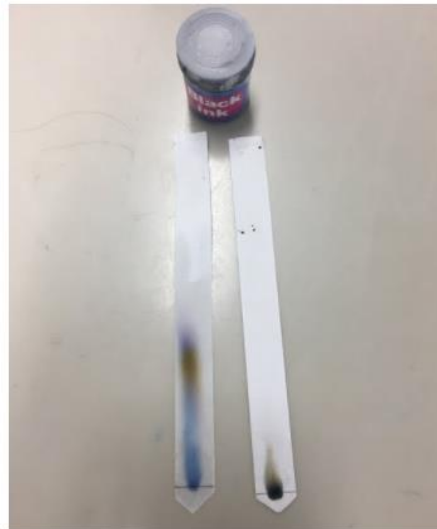


between dissolving in water and in ethanol.

Every left filter paper of each ink is done with water while every right filter paper of each ink is done with ethanol.



The ransom note



Comparison of the black ink between dissolving in water and ethanol

# DOCUMENTATION OF RESEARCH:

- **Paper chromatography** is an analytical method used to separate colored chemicals or substances. It is primarily used as a teaching tool, having been replaced by other **chromatography** methods, such as thin-layer **chromatography**.
- **Paper chromatography** makes use of the fact that different substances in a **mixture** dissolve to different extents in a particular solvent. This means that the substances move at different rates up the **chromatography paper**. Substances that are more soluble in a solvent will move faster than substances that are less soluble.
- Separation methods such as filtration and distillation require a large amount of mixture to be separated. However, it is not always possible to have such a large amount of a **mixture**. Thus, it is more convenient to use **paper chromatography** when working with a small amount of **mixture**.
- **Ink** is usually a **mixture** of different dyes. **Paper chromatography** can be used to find out different kinds of dyes that make up different **inks**. This is useful especially in cases where we need to find out if written documents have been forged.
- We can use **paper chromatography** to identify the contents of a **mixture** and test the purity of a substance.
- **Chromatography** is the technique used to separate small amounts of components in a particular solvent.

SEC 1 EXCITE PROGRAMME- 1GRACE GROU...

Home About Us Problem Statement 1 Problem Statement 2 Group Presentation Group Critique Inc



How paper chromatography works:

- [Link](#) (click the link)
- **Research** (click to see our research on paper chromatography)



How simple distillation works:

- [link](#) (click the link)
- **Research** (click to see our research on simple distillation)

# K-W-L:

## What do we know?

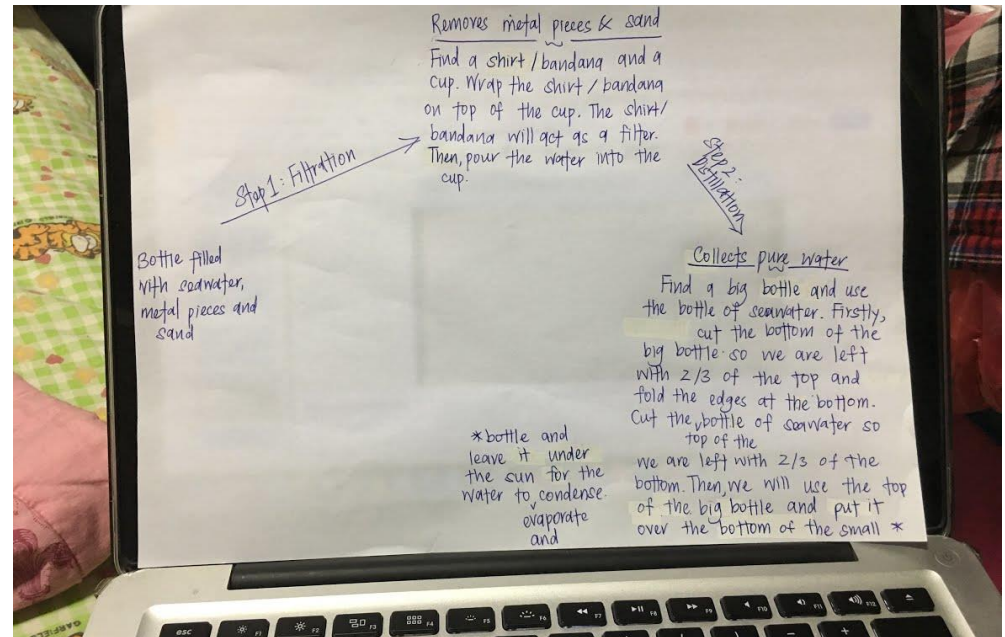
- Ink is a solute.
- Ink is a mixture.
- The separation technique of ink is p
- The ink is weaker than the solvent th

## What do we want to know?

- Is the ink a pure substance or a mix
- What is the solvent that made the ra
- Is the ink an element or compound?

## What we learnt?

- The more soluble the ink (solute) is ,
- Different inks have different solubili



# Students' reflection

## Reflection 1

I learnt another new way of getting pure water and that is filtration. I also learnt which materials are needed for filtration and Also learnt that we need to use a filter paper if we want to use this method of obtaining pure water.

My group did well In reminding each other to do the project and assignments. Also, they cooperate well.

However, we can improve by Helping more often as we got a date when most of our group members cannot do the project and so led to insufficient data.

## Reflection 2

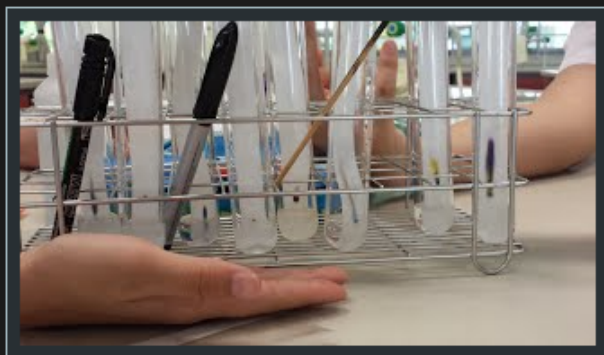
In my recent science project, I've learnt different ways to filtrate dirty water to clean water. This could be important as it may be used one day. When my team and I were working together, I noticed that there was teamwork among us all. We helped one another despite of troubles... Although there is a good side of the group, there is also a bad side and that is we have to work faster as I notice that we have been spending too much time editing then researching...

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# CONCLUSION

- The ratio of the distance a compound moved to the distance the solvent moved is called the Rf value. You can calculate the Rf value for any band by dividing the distance the band traveled from the original line to the distance the solvent traveled from the original line.<sup>[10]</sup>
- For example, if you have a band two inches past above the line you made and the solvent traveled five inches above the solvent, you could use the equation  $D_{\text{band}}/D_{\text{solvent}} = R_f$ . For this example, that means:
  - $R_f = 2 \text{ inches} / 5 \text{ inches}$
  - $R_f = 0.4$



The conclusion is : The kidnapper used the Stabilo Marker.

# Parents play a key role



# Support from Parents

1. Set High Expectations
2. See Science Everywhere
3. Lead family discussions on science-related topics
4. Encourage boys and girls equally
5. Connect Science with a family vacation
6. Be active in your children's formal Science education

# 1. Set High Expectations

“I never liked science in school”

“I got my worst grades in science”



“I am glad I can learn together with you.”

“I’m so glad that you are having opportunities that I missed.”



## 2. See Science Everywhere

“What would happen if...”

“Why does this happen?”



### 3. Lead family discussions on Science related topics

“Remember that scene in the movie...”



“Hey son, there is this article in the Straits Times on the discovery of...”



## 4. Encourage boys and girls equally

What we say is important.

We influence our sons and daughters.



## 5. Connect Science with a family vacation

We can choose what to do or where to go on a vacation...



## 6. Be active in your children's formal Science education

Get to know the teachers and the curriculum

Participate in the school's science programme

Class	Teacher
1 Faith	Ms Hui Ru
1 Joy	Mr Foo Seng Hong
1 Love	Mr Esmond Tay
1 Peace	Mr Foo Seng Hong Mr Desmond Tan
1 Grace	Ms Daphne Khoo
1 Hope	Mr Esmond Tay

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THANK YOU