

# How We Integrated Talk with Writing in the Subject Classroom

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English in a Future-ready Singapore

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ELIS

# WSA-EC Journey at CHIJ STC

2014

WSA-EC Objectives

Identification &  
Training of WSA-EC  
Subject Champions  
Communication at  
Staff & Department  
Meetings

2015

Language  
Awareness in the  
Subject Classroom

Mind Your Language  
Word of the Day  
Conversations at  
Staff, Department,  
Subject Level

2016

Opening Up Talk for  
Learning in the  
Subject Classroom

Morning Assembly  
PLT Projects  
Conversations at  
Staff, Department,  
Subject Level  
Structured Talk time  
during lessons

2017

Integrating Talk  
with Writing in the  
Subject Classroom

Staff Professional  
Development  
Workshops  
Integration into  
lessons, SOWs



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# ITWSC: Our key considerations

## 2017 (Year 3):

- What do students need to know to respond successfully to a written task? (content knowledge)
- What do they need to be able to do to write a response to the task? (language skills)

What content vocabulary and functional language should they use?

How can they structure their written answer?

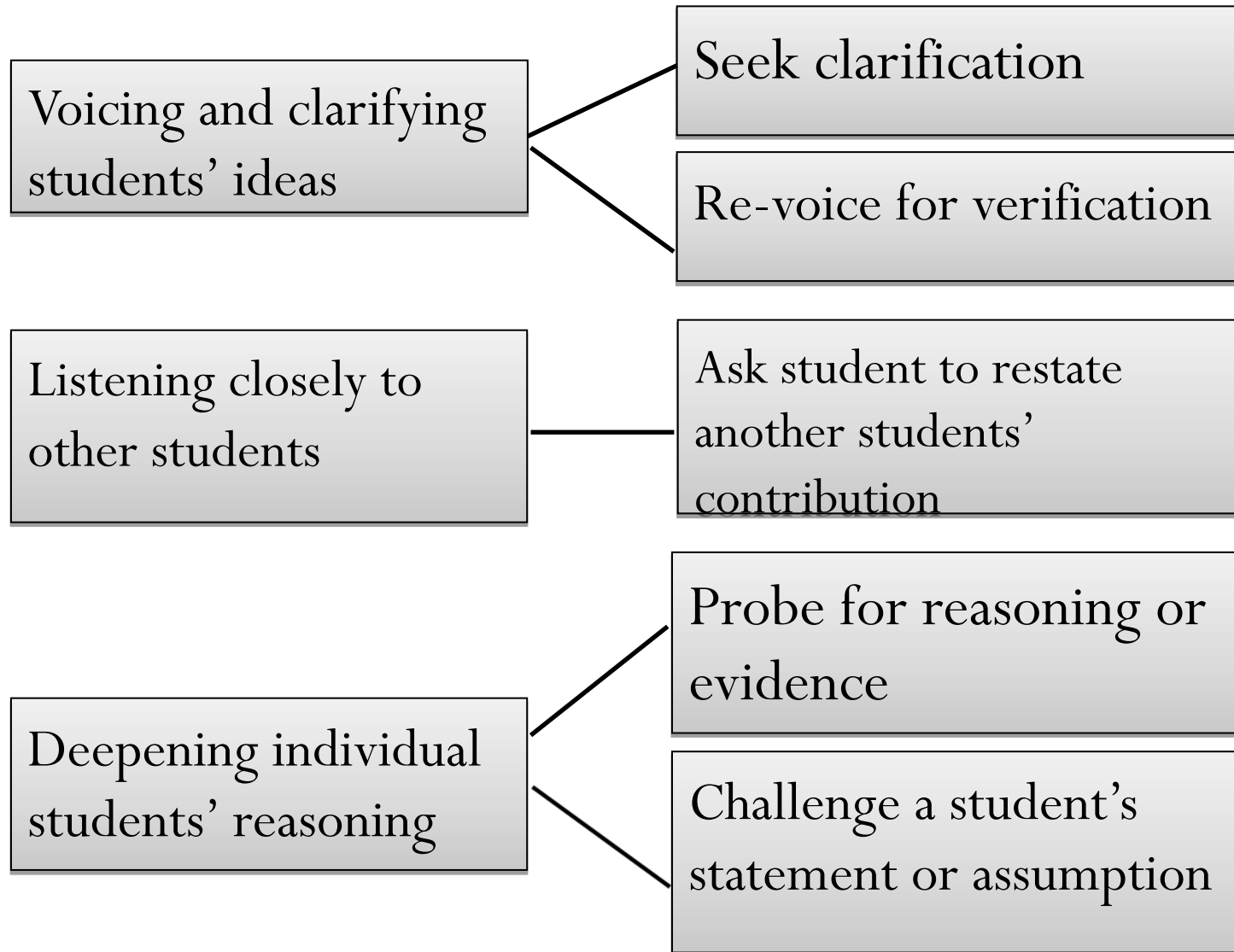


# Using talk to support students' writing

1. Understanding the writing task
2. Analysing and interpreting information
3. Turning students' responses into the written form
4. Thinking aloud about how to write
5. Scaffolding the structure of a written text



# Use of talk moves



# Writing skills in Literature

## Strand 2: Developing and Communicating Responses to Texts

<b>LO 2.1</b>	<b>Develop personal and critical responses to texts</b>
<b>KSDs</b>	<ul style="list-style-type: none"><li>• Formulate personal responses (e.g., thoughts, feelings, opinions) to a text by making connections between it and prior knowledge, personal experiences and imagination</li><li>• Critically refine personal responses through analysis, interpretation, evaluation, and synthesis of textual evidence</li><li>• Express responses in a variety of ways (e.g., diary entries, role play, creative writing, music)</li></ul>
<b>LO 2.2</b>	<b>Construct and effectively communicate arguments</b>
<b>KSDs</b>	<ul style="list-style-type: none"><li>• Identify a text's main concerns for discussion</li><li>• Demonstrate sound understanding of a text in responses</li><li>• Develop ideas effectively (e.g., through elaboration, anticipating counter arguments where appropriate)</li><li>• Substantiate responses through judicious selection of evidence from a text</li><li>• Demonstrate sound reasoning throughout responses</li><li>• Articulate a consistent viewpoint</li><li>• Produce sensitive and informed personal responses</li><li>• Produce clear, organised and coherent responses</li><li>• Produce sustained written responses that convey arguments</li><li>• Use the appropriate metalanguage with understanding (e.g., simile, metaphor, foreshadowing, line, stanza, act, scene, narrator)</li></ul>
<b>LO</b>	<b>Respond to different views and perspectives</b>

- Cognitive demand on the student is high
- Writing is a consolidation of many skills (both content and language skills)
- Appropriate for integrating AfL



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# Applying talk to support writing in Literature

1. Understanding the writing task: break down the question and defining key terms together
2. Analysing and interpreting information: select relevant and appropriate examples, explaining why the info is meaningful (so what?)
3. Turning students' responses into the written form: students verbalise their thinking, contribute their text analysis
4. Thinking aloud about how to write: verbalise rationale behind what is being written/ what should be included
5. Scaffolding the structure of a written text: guide students through what the written answer demands



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# Literature task: Sample 1

3. How has Rose changed by the end of Ch. 11?

In what ways

Compare start & end /  
Compare before & after  
Personality (her thoughts / actions / behaviour)  
reaction / response to others → Ted

Understanding  
the writing task

Functional  
lang.

allows h/s to be taken adv of.  
← defend / confident  
In my opinion, Rose has changed through the way she stood up for herself. At first / Before / Previously, Rose was indecisive and dependant on Ted and others to assure her and help make decisions. She "(talked) to too many people..." which shows she sought other people's opinions on her marriage instead of deciding for herself. She also "learned to choose from the best opinions" which suggests that she consults others for her options instead of making / formulating her own ideas. She was unsure about what she wanted and could not decide for herself. Later on / However afterwards / By the end of the chapter, Rose finally stood up for herself because her mother told her to "speak up". She told Ted she was staying put. She finally learned not to give in to Ted, and not be meek and submissive.



# Transcript of Teacher-Student Talk: Sample 2

27	T	Ok, now you give me the evidence which shows grimness.
28	SS	.....
29	T	Why that? Is that the best example you have? We are talking about imagery so you'd better give me the best piece of evidence with imagery.
30	S4	"Bent double"?
31	T	Ok, what does "bent double" tell us?
32	S5	They were fatigued to the point of exhaustion...
33	T	So?
34	S3	They were unable to stand upright...
35	T	Ok tell me something else. Another piece of evidence with imagery. Remember you want to choose the best evidence to support your point.
36	S1	"In all my dreams, before my helpless sight, / He plunges at me, guttering, choking, <u>drowning</u> "?
37	T	Ok what is so effective or significant about this?
38	S3	Watching his comrade die...
39	S4	He was powerless in his comrade's struggle...
40	T	But he couldn't do anything to help... ok that's your explanation there. What else? What other analysis? So far, this is only a 14 maybe a 15/25. Tell me more.
41	S8	No matter how desperately his friend struggled...
42	S9	The situation was hopeless...
43	T	The situation was hopeless because... the poet paints a vivid image of... (Student's name) tell me what you said again?
44	S8	No matter how desperately his comrade struggles he will still be unable to help him.



# Transcript of Teacher-Student Talk: Sample 2

Analysing  
and  
interpreting  
info

Thinking  
aloud  
about how  
to write

27	T	Ok, now you give me the evidence which shows grimness.
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44	S8	No matter how desperately his comrade struggles he will still be unable to help him.



# Written answer: Sample 2 cont'd

- imagery, diction,
  - mood: grim / bleak / solemn, hopeless; panicked / frenzied; horrific
- vibe / feeling /  
air / aura
- ~~~~~ → more explanation of imagery needed.

The poet uses imagery to create grimness in the poem. The mood is rather heavy and hopeless. This can be seen through the phrase "bent double" which tells us the soldiers were fatigued to the point of exhaustion and unable to stand upright. Also, "in all my dreams... drowning" shows us that the persona's comrade was dying but he couldn't do anything to help him. The situation was hopeless because the poet paints a vivid image of his comrade's struggles in relation to the persona being unable to help. We notice that the persona is enveloped by guilt as this scene replays "in all (his) dreams". This guilt he feels contributes to the grim mood of the poem because now we understand that war is bleak and traumatising.



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# Written answer: Sample 2 cont'd

## 1. Content vocabulary

air / aura

## 2. Functional language

panicked / frenzied ; horrific

→ more explanation of imagery needed.

The poet uses imagery to create grimness in the poem. The mood is rather heavy and hopeless. This can be seen through the phrase "bent double" which tells us the soldiers were fatigued to the point of exhaustion and unable to stand upright. Also, "in all my dreams... drowning" shows us that the persona's comrade was dying but he couldn't do anything to help him. The situation was hopeless because the poet paints a vivid image of his comrade's struggles in relation to the persona being unable to help. We notice that the persona is enveloped by guilt as this scene replays "in all (his) dreams". This guilt he feels contributes to the grim mood of the poem because now we understand that war is bleak and traumatising.



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# Teacher Reflections

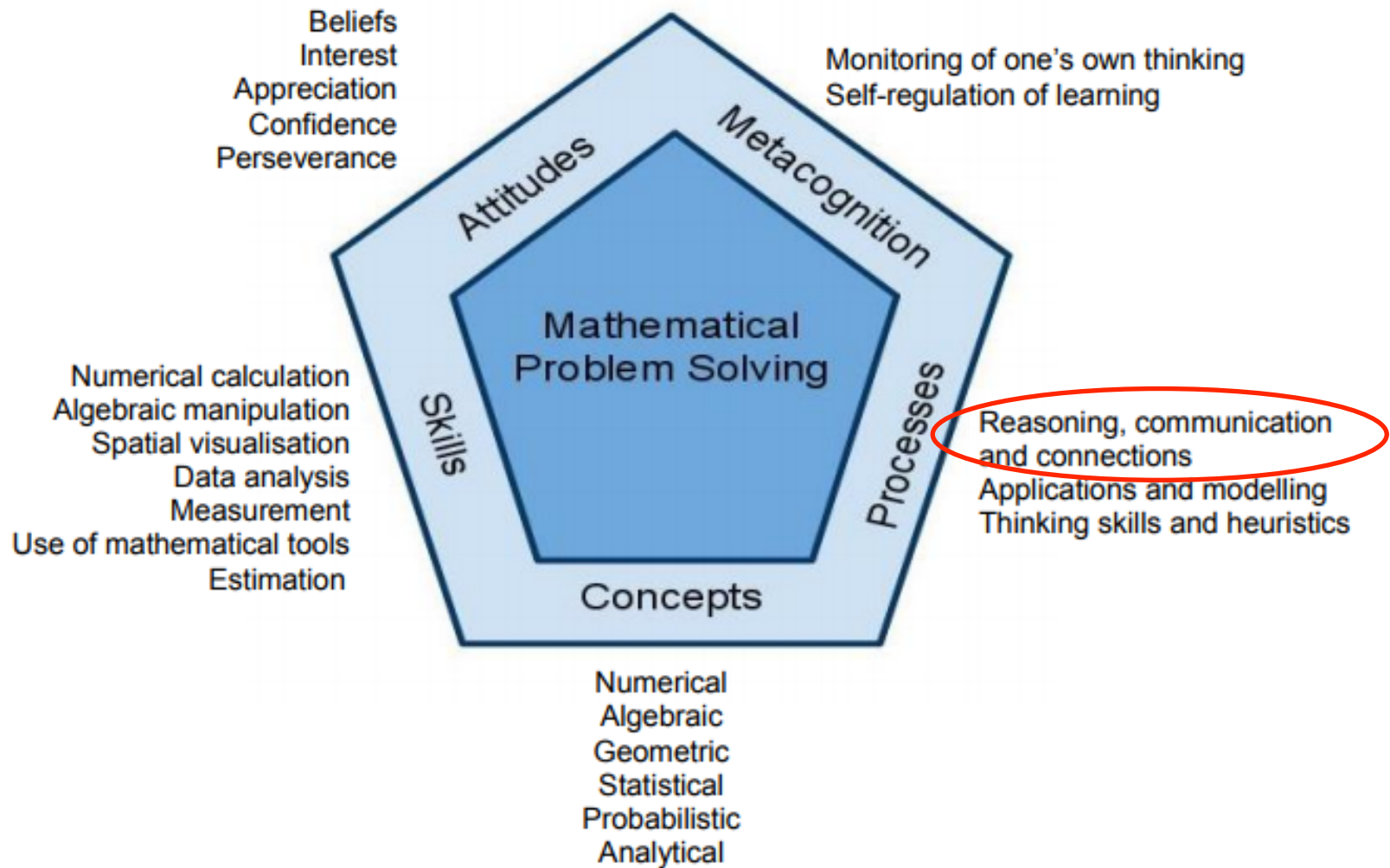
- Deliberate and productive talk in the classroom → focused learning environment
- Students gained greater clarity of what they are required to do and how they are required to write
- Students gained more confidence when sharing their ideas
- A small classroom size is advantageous; students can follow a script/facilitator's guide



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# Mathematics Curriculum Framework



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# Mathematics task

- Design task that is suitable for reasoning

## Statistical Reasoning

The lifetime of 100 brand *A* batteries is given in the table below.

Lifetime ( $t$ hours)	Number of batteries
$0 < t \leq 40$	16
$40 < t \leq 80$	22
$80 < t \leq 120$	34
$120 < t \leq 160$	18
$160 < t \leq 200$	10

Calculate

- (i) the mean, [1]  
(ii) the standard deviation [2]

The mean and standard deviation of the lifetime of 100 brand *B* batteries is shown below.

Mean	99 hours
Standard Deviation	41.9 hours

[2]

Compare the results in two different ways of the two brands.

<https://sites.google.com/site/stc4caringstudents/statistical-reasoning>



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# Mathematics written answers

Compare the results in two different ways of the two brands.  
Response 1

(iii) Brand A batteries have a mean of 93.6 while Brand B batteries have a mean of 99<sup>was</sup> which is better because it has a longer lifespan. Mathematical terms

Brand A batteries have a standard deviation of 47.6 while Brand B batteries have a standard deviation of 41.9. In this case, Brand A batteries are better because its spread is more consistent than Brand B batteries. Comparison

Context Conclusion

Response 2

The standard deviation for A batteries is greater than that of B batteries.  
The mean of B batteries is greater than that of A batteries.

<https://sites.google.com/site/stc4caringstudents/statistical-reasoning>



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# ICT-mediated 'talk' to support learning in Mathematics

10:04 AM Apr 6 ▾

response 1 is better as it has evidence and more data from the figure provided.

Reply



**Audrea Cheang**

what kind of evidence do we need?

10:04 AM Apr 6



we need the figures given in the data

10:05 AM Apr 6



response 1 , its more specific

Reply



**Audrea Cheang**

be more specific

10:05 AM Apr 6



statistical data is written as part of the ans .

10:06 AM Apr 6



response 1 explains both in terms of mathematics and also relates the information according to the context of battery lifespan



Response 1 is better because she went into specific details which gives a clearer description because she compared both batteries with each other.



Response 1 is better as it is specific and contains the details which is needed for comparison. (standard of deviation.)

# Scaffolding Talk in Mathematics

## Consolidation of key ideas

What are the important elements when answering such statistical reasoning questions?

statistical data , units ,

Alicia

Compare answer  
Use the context of the question  
Use units  
Conclusion

conclusion for

units and conclusion

answering to the text

Name of the question

units

1. units  
2. answer in context to the question  
3. compare  
3. conclude

important elements:

- the correct units
- a comparison
- a conclusion

Make sure the data is answering the question  
units  
conclusion  
MUST BE SPECIFIC

Don't use exact values but use words to compare like smaller

Anika

Write units, accurate, specific comparison, relevant context of the question.

Be careful with units

units

units

specify what question is asking for

answering to the text of the question

units



# Using Talk to Monitor Learning in Mathematics

## Mathematical Terms

Brand A batteries have a mean of 96.3 hours while the Brand B batteries have a mean of 99 hours. This shows us that the Brand B batteries are better as they have a longer lifespan. Brand A batteries have a standard deviation of 47.6 hours while the Brand B batteries have a standard deviation of 41.9 hours. This shows us that the Brand B batteries are better as they have a smaller spread thus Brand B batteries are more consistent than the Brand A batteries.

10:26 AM Apr 6

Comparison Conclusion & Context



Brand B Batteries has a larger mean than Brand A Batteries, thus it is more long-lasting as it has a longer lifespan. Brand B batteries has a smaller standard deviation as compared to Brand A batteries. This makes Brand B batteries better as it has a more consistent spread.

10:28 AM Apr 6 - Comments off -



Brand B batteries has a bigger mean than Brand A batteries. Thus, it has a longer life span.  
Brand B batteries has alower standard deviation than BrandA batteries. Thus, its spread of data is more consistent.

10:28 AM Apr 6 - Comments off -

Battery of brand A has a higher mean than Brand B which shows that Brand B is better as it can last longer than the battery of brand B .The battery of Brand A has a higher standard deviation than the battery of Brand B which shows that the battery of Brand B is better as it is shows that the performance is more consistent than the battery of brand A

10:27 AM Apr 6 - Comments off -



the batteries of brand b have a longer lifetime than the batteries of brand a as the mean of brand a batteries is 93.6 hours while the mean of brand b batteries is 99 hours.

10:27 AM Apr 6 - Comments off -

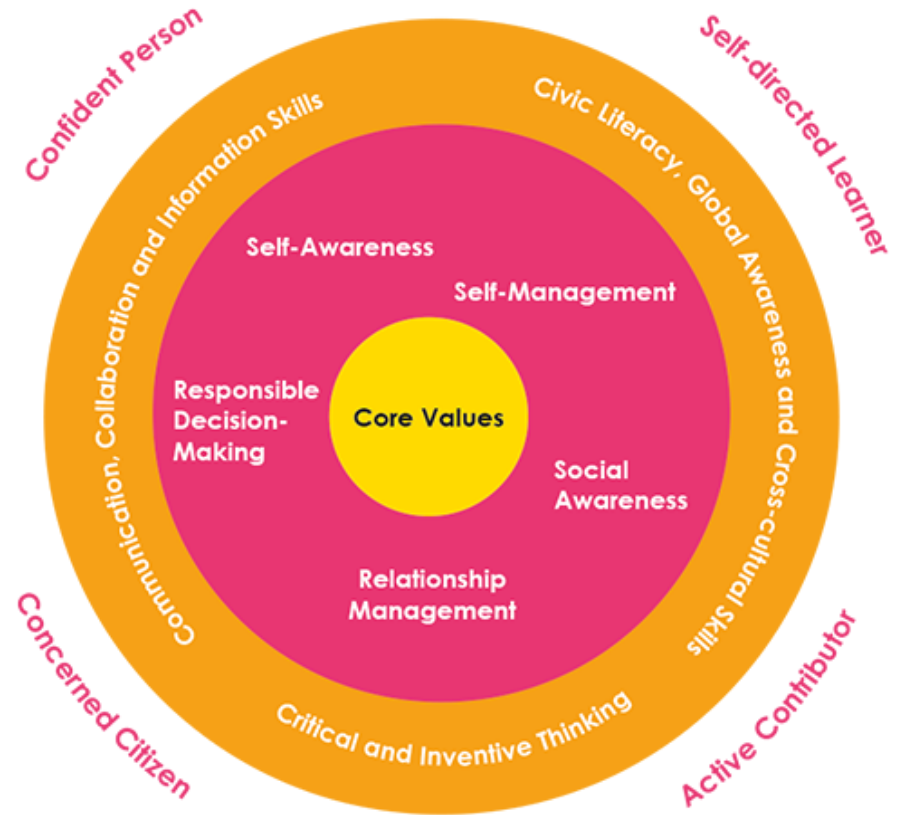
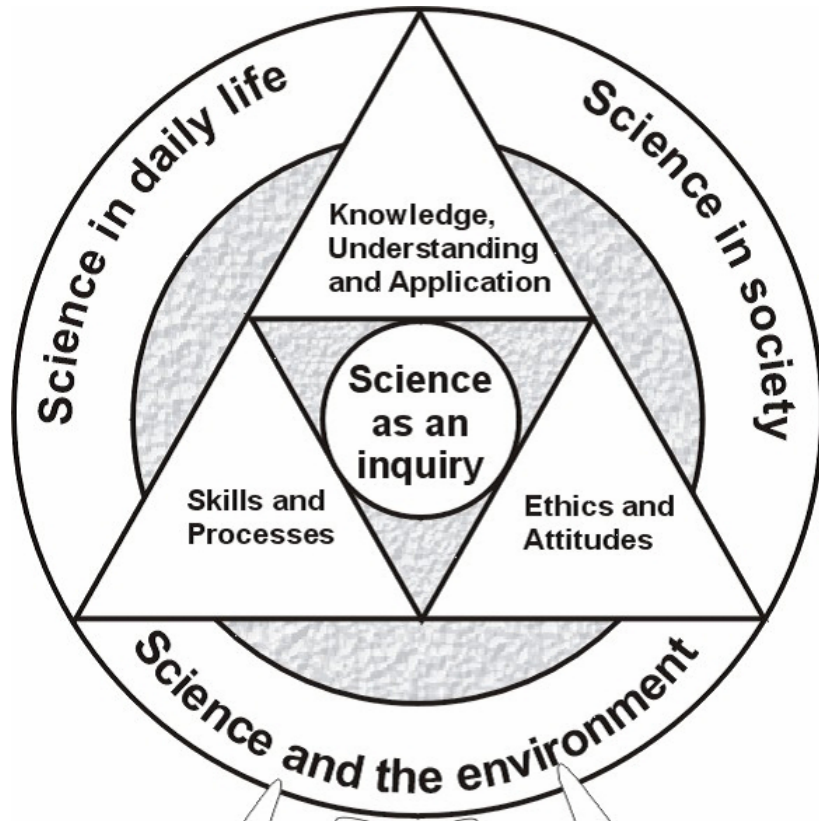
also, brand a batteries have a standard deviation of 47.6 hours while brand b batteries have a standard deviation of 41.9 hours, which shows that brand b has a smaller spread, meaning that its lifetime is more consistent.

therefore, brand b is better than brand a, as it does not only have a longer average lifetime, but is also more consistent.



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# Science Curriculum Framework



*Student as the Inquirer*  
*Teacher as the Leader of Inquiry*

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Ministry of Education, Singapore

## Communicating

This is the skill of transmitting and receiving information presented in various forms - verbal, tabular, graphical or pictorial.



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# Syllabus Aims

## AIMS

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These are not listed in order of priority.

The aims are to:

1. provide, through well-designed studies of experimental and practical chemistry, a worthwhile educational experience for all students, whether or not they go on to study science beyond this level and, in particular, to enable them to acquire sufficient understanding and knowledge to
  - 1.1 become confident citizens in a technological world, able to take or develop an informed interest in matters of scientific importance
  - 1.2 recognise the usefulness, and limitations, of scientific methods and models and to appreciate their applicability in other disciplines and in everyday life
  - 1.3 be suitably prepared for studies beyond Ordinary level in chemistry, in applied sciences or in science-related courses.
2. develop abilities and skills that
  - 2.1 are relevant to the study and practice of science
  - 2.2 are useful in everyday life
  - 2.3 encourage efficient and safe practice
  - 2.4 encourage effective communication.



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# Assessment Objectives

## B Handling Information and Solving Problems

Students should be able – in words or by using symbolic, graphical and numerical forms of presentation – to:

1. locate, select, organise and present information from a variety of sources
2. translate information from one form to another
3. manipulate numerical and other data
4. use information to identify patterns, report trends and draw inferences
5. present reasoned explanations for phenomena, patterns and relationships
6. make predictions and propose hypotheses
7. solve problems.

These assessment objectives cannot be precisely specified in the subject content because questions testing these objectives may be based on information which is unfamiliar to the candidates. In answering such questions, candidates are required to use principles and concepts that are within the syllabus and apply them in a logical, reasoned or deductive manner to a novel situation. Questions testing these objectives will often begin with one of the following words: *predict*, *deduce*, *suggest*, *calculate* or *determine*. (See the *Glossary of Terms*).



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# Glossary of Terms

## GLOSSARY OF TERMS USED IN CHEMISTRY PAPERS

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It is hoped that the glossary (which is relevant only to science papers) will prove helpful to candidates as a guide, i.e. it is neither exhaustive nor definitive. The glossary has been deliberately kept brief not only with respect to the number of terms included but also to the descriptions of their meanings. Candidates should appreciate that the meaning of a term must depend in part on its context.

1. **Calculate** is used when a numerical answer is required. In general, working should be shown, especially where two or more steps are involved.
2. **Classify** requires candidates to group things based on common characteristics.
3. **Comment** is intended as an open-ended instruction, inviting candidates to recall or infer points of interest relevant to the context of the question, taking account of the number of marks available.
4. **Compare** requires candidates to provide both similarities and differences between things or concepts.
5. **Construct** is often used in relation to chemical equations where a candidate is expected to write a balanced equation, not by factual recall but by analogy or by using information in the question.
6. **Define (the term(s)...) is intended literally. Only a formal statement or equivalent paraphrase being required.**
7. **Describe** requires candidates to state in words (using diagrams where appropriate) the main points of the topic. It is often used with reference either to particular phenomena or to particular experiments. In the former instance, the term usually implies that the answer should include reference to (visual) observations associated with the phenomena. In the latter instance the answer may often follow a standard pattern, e.g. Apparatus, Method, Measurement, Results and Precautions.

In other contexts, *describe and give an account of* should be interpreted more generally, i.e. the candidate has greater discretion about the nature and the organisation of the material to be included in the answer. *Describe and explain* may be coupled in a similar way to *state and explain*.



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# Effective Communication in Chemistry

**Describe** the effect of increasing temperature on the speed of a chemical reaction.

The speed of a chemical reaction increases with increasing temperature.

**Explain** the effect of increasing temperature on the speed of a chemical reaction.

An increase in temperature leads to an increase in the kinetic energy of the reactant particles. The particles move at greater speeds and collide more frequently, leading to an increase in the frequency of effective collisions that results in an increase in the speed of reaction.



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# What supports students' effective writing in Chemistry

## Students

- ✓ write about interesting experiences and investigations.
- are encouraged to express their ideas, and to communicate ideas clearly, even if spelling and grammar aren't perfect.
- have a chance to **talk before** they **write**.
- are **strategically** paired or grouped to help each other write, and prepare to write, by **talking**.
- are encouraged to **express their thinking** through pictures as well as words.



# What teachers can do to support effective writing in Chemistry

- Teachers **model** the kinds of thinking and writing they want to encourage their students to produce
- Teachers use **prompts** that clearly relate a writing task to a particular science phenomenon or experience
- Teachers provide the students with **constructive feedback** on their writing that pushes them to **expand and clarify** their thinking



# What teachers can do to support effective writing in Chemistry

## BEFORE

The teacher tells students the key components/ considerations in a scientific investigation.

Students devise their own individual experimental plans.

The teachers marks the experimental plan and returns it to the students.

Debriefs students as a whole class highlighting common mistakes.

Students do corrections and produce a final experimental plan.

## AFTER

The teacher models "thinking aloud" to highlight key components/ considerations in a scientific investigation.

Students do individual drafts of experimental plan with "self-talk" guided by "criteria for success" provided by the teacher.

Students discuss in pairs and come up with a "synthesised" experimental plan.

Whole class sharing based on plans of selected pairs of students. Students refine their plans.

One-to-one "viva voce" with students to provide feedback on their refined experimental plan.

Students produce a final experimental plan.



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# Applying talk to support writing in Chemistry

What happened during the lesson....	How does it align to “using talk to support students’ writing”
The teacher models “thinking aloud” to highlight key components/ considerations in a scientific investigation.	Understanding the writing task. Thinking aloud about how to write. Analysing and interpreting information.
Students do individual work on drafts of experimental plan with “self-talk” guided by “criteria for success” provided by the teacher.	Scaffolding the structure of a written text Thinking aloud about how to write
Students discuss in pairs and come up with a “synthesised” experimental plan.	Turning students’ responses into the written form
Whole class sharing based on plans of selected pairs of students. Students refine their plans.	Voicing and clarifying students’ ideas Listening closely to other students
One-to-one “viva voce” with students to provide feedback on their refined experimental plan.	Deepening individual students’ reasoning
Students produce a final experimental plan.	Turning students’ responses into the written form



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# Improvement in the students' writing of their experimental approach

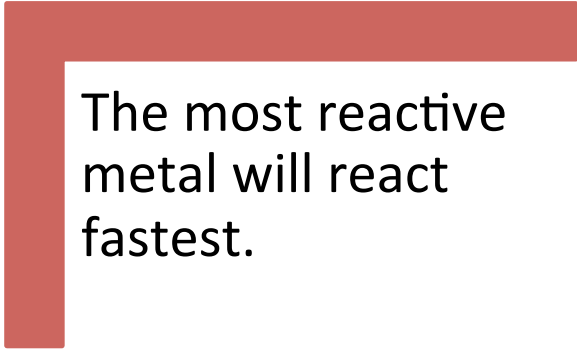
Some metals react with acids. The three metals are added to test tubes containing the same acid. The time taken for the reaction to be completed determines the order of reactivity of the metals.

Some metals react with acids to **produce a salt and hydrogen gas**. Samples of the three metals with the **same mass** are added to conical flasks which contain the same **amount of** acid. The time taken for each metal to react completely with the acid **is measured with a stopwatch and recorded**. **The shorter the time taken for the metal to react completely with the acid, the higher the reactivity of the metal.**

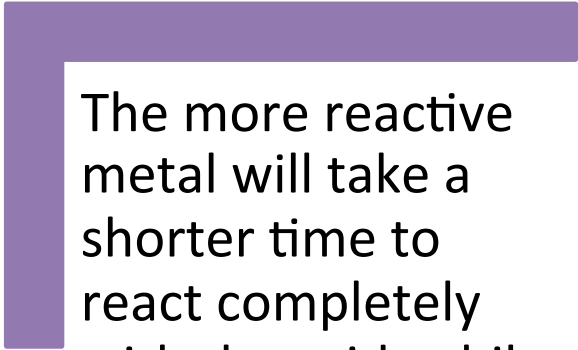
Some metals react with acids to produce a salt and hydrogen gas. Samples of the three metals with the same mass and **physical form (powder, granules, or strips)** are added **separately** to conical flasks which contain the same volume and concentration of acid. The acid is **present in excess**. The time taken for each metal to react completely with the acid (**when no more gas is given off**) is measured with a stopwatch and recorded. The shorter the time taken for the metal to react completely with the acid, the higher the reactivity of the metal.




# Improvement in the students' writing of their processing of data



The most reactive metal will react fastest.



The more reactive metal will take a shorter time to react completely with the acid, while the less reactive metal will take a longer time to react completely with the acid.



The metals are then arranged according to the time taken for complete reaction with the acid. The shorter the time taken for the metal to react completely with the acid, the higher the reactivity of the metal.



# Teacher Reflections

- Greater clarity in my thought processes and instructional planning
- Contributions from students are valued and respected
- Students develop greater confidence and engagement, and the “collective wisdom” of unique individuals is harnessed
- Moves away from teacher’s model answers to students’ own answers that are equally credible



# Teacher Reflections

## Challenges

- Time
- Resisting the urge to provide answers
- Preparing ahead of time + Flexibility
- Not all students are receptive and cooperative

## Recommendations

- Patience & Communication
- Plan ahead and set aside time
- Practice, practice, practice





# Going forward

- How can I reduce teacher-talk and increase student-talk?
- How can I make productive talk a classroom routine?
- How can I provide better support through talk for my students' writing?
- How can I use criteria for success in order for students to write effectively?
- \*\*How can I stretch students who already write effectively?



**Thank you & God bless you 😊**

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