Opening up talk for learning in the subject classroom

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THE GESS APPROACH

- Area of focus: Professional Development

- Area of development: Classroom Language
  - ✓ Quality Questioning Techniques OR
  - ✓ Dialogic Teaching & Learning

- Outcome: Teacher Cognitive Academic Language Proficiency (CALP)

- Time Frame: 3 Years

Students are always asked to do these:

Evaluate
Distinguish
Outline
Summarise
Analyse
Hypothesise
Compare
Classify
Interpret, etc…

These are thinking skills which are often best developed in conversations.

Design & Technology (D&T)

by Mr Jeffrey Sui

Class: Sec 1 (Express/ NA)
Topic: Design Specifications
Goals: To understand the relationship between **Design Factors**, **Design Considerations** and **Design Specifications**. **Learning Tasks**: To craft five detailed design specifications for the product (sensing device for watering indoor plants).

Design & Technology (D&T)

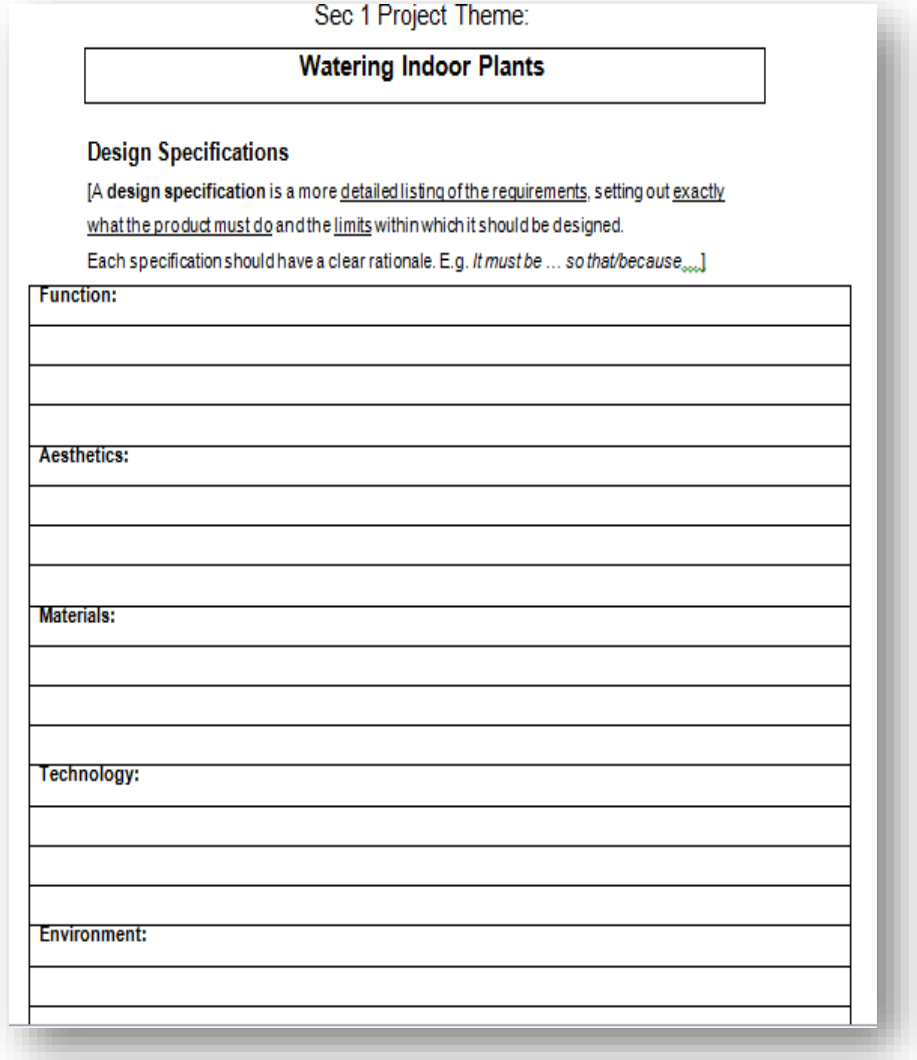
Context for Productive Academic Discussion:

What are some of the important design factors to be considered when designing a product (sensing device for watering indoor plants)?

What is the relationship between Design Factors, Design Considerations and Design Specifications?

Focus Areas:

1. Voicing & Clarifying students' ideas
2. Deepening reasoning
3. Engaging with each other's reasoning
4. Consolidating discussion points



Sec 1 Project Theme:

Watering Indoor Plants

Design Specifications

[A **design specification** is a more detailed listing of the requirements, setting out exactly what the product must do and the limits within which it should be designed.

Each specification should have a clear rationale. E.g. *It must be … so that/because…*]

Function:

Aesthetics:

Materials:

Technology:

Environment:

Using Talk moves in Design & Technology

Talk Move	Frames for Prompting (Teacher)	Frames for Responding (Students)
Voicing & Clarifying ideas	Can you share with us what are some important factors you have considered in selecting the 6 secondary schools and input into the system?	To me the school cannot be too far…
	When you say "not too far", do you mean "Distance" between your house and the school?	Yes, distance is an important **factor** for selecting a school.
	So you're saying that "Distance" is an important **factor**.	Yes, that 's right.

Using Talk moves in Design & Technology

Talk Move	Frames for Prompting (Teacher)	Frames for Responding (Students)
Probe to Deepen Reasoning	Can you share what are some **considerations** or **questions** which you have concerning distance between your house & the school? Why is this consideration important to you? How far are you willing to walk? What will be the **specific requirement** with regard to this consideration?	Questions like… Is the school within walking distance from my house? It is important **because** I need not wake up too early, can have more rest…and not worry about waiting for bus or train. I think the **requirement** I will set for myself would be the school must be within 1 km from my house.

Using Talk moves in Design & Technology

Talk Move	Frames for Prompting (Teacher)	Frames for Responding (Students)
Guide student to build on other student's contribution	Would anyone like to add on? Anyone has a **different consideration** with regard to the **same factor** on Distance? How long a duration are you willing to travel? What will be the **specific requirement** you would like to have with regard to this consideration?	I don't mind taking train or bus but don't like to walk. I will **consider** if the school is near MRT station… or if there a direct bus…or… how long is the travelling time required. I think the **requirement** I will set for myself would be the travel time must be within 45 minutes maximum.

Using Talk moves in Design & Technology

Talk Move	Frames for Prompting (Teacher)	Frames for Responding (Students)
Consolidating Discussion Points	What have we learnt about the **factors, considerations** & **specifications** through our discussion? How are they related? How can we bring all this learning together to craft the design specifications for Sensing device for watering indoor plants?	Factors, considerations & specifications are related to one another. **Factors** are the main aspects to look into… **Considerations** feature a list of questions to ask… **Specifications** are the specific requirements to decide…

Supporting talk with writing

Recording on the whiteboard to consolidate the points of discussion. The layout of the board work will allow students to see the relationship between the points raised.

Factor for selecting a secondary school	Considerations (Questions)	Specifications (Requirements)
Distance	Is the school within walking distant from my house? Is the school near MRT station? Is there any direct bus to the school? How long is the travelling time required?	The school must be within walking distance of 1km from my house so that I need not wake up too early & can have more rest. The travelling time to the school must be within 45 minutes so that….

Supporting talk with writing

Recording on the whiteboard to consolidate the points of discussion. The layout of the board work will allow students to see the relationship between the points raised.

Design Factor for designing a Sensing Device for watering indoor plant	**Design Considerations (Question)**	**Design Specifications (Requirements)**
Function	How to sense water? How to adjust the sensitivity? How to alert the user?	It must be… so that… It must be… so that… It must be… so that…
Aesthetics	What shapes will be appropriate? What colours will be suitable?	It must be… so that… It must be… so that…
Materials	Should it be waterproof?	It must be… so that…

How talk moves impacted student learning

- Opportunity to help students **move beyond memorisation** of facts. Helps students to evaluate the facts and use them meaningfully in problem solving.

- **Think** in real time, think on their feet, more attentive during lessons.

- **Listen** to one another, compare answers, build on answers.

Support for productive academic discussions

- Establishing **shared conversation norms**. Students need to know what is expected of them in discussions in order for conversation skills to be built.

- Important to help students **stay on the path** of the discussion.

- **Attitudes** for effective communication: Humility, Thoroughness, Respect, Positivity, Interest.

Humanities (Geography)

by Ms Shirley Tan

Class: Secondary 4 Express
Topic: Impacts of Tourism
Goals: • Assess the impact of tourism on a country – economic, socio-cultural and environmental aspects • Explain how tourism can be made sustainable • Compare the roles of various groups in taking care of the tourist areas

Humanities (Geography)

Academic discussion:

What are some of the economic / socio-cultural / environmental impacts of tourism?

Focus Area:

1. Voicing & Clarifying students' ideas
2. Engaging with each other's reasoning
3. Consolidating the discussion points

Using Talk moves in Geography

Focus Area: Voicing & Clarifying students' ideas

Turn	Respondent	Response	Talk move
2	Teacher	J, can you share with me what you think are some economic benefits of tourism?	
3	Student (J)	Tourism brings in money for the country.	
4	Teacher	**Specifically, what do you mean when you said** "tourism brings in money for the country"?	Seek clarification
5	Student (J)	Hmmm, I mean, for example, when there are more people employed in the tourism industry, income grows for the individuals like the fishermen in the Philippines, in some island. Then there will be an overall increase in revenue in terms of taxes collected by the country.	
6	Student (C)	Pamilacan Island…	

Using Talk moves in Geography

Focus Area: Voicing & Clarifying students' ideas

Turn	Respondent	Response	Talk move
23	Student (C)	Ya! Seasonal unemployment. Thanks, bro! It's like some jobs depend on the weather, like ski resorts. In summer, there is no snow so the ski resort can't function so people are not employed to run the place. But the same place may need a lot of workers during their peak period.	
24	Teacher	**So you are saying** at certain periods of time, some jobs are not required?	Re-voice for verification

Using Talk moves in Geography

Focus Area: Engaging with each others' reasoning

Turn	Respondent	Response	Talk move
7	Teacher	Thank you, J. We will get someone else to expand on your answer. **Who would like to respond to J's idea? Do you agree or do you not agree?**	Elicit students' views on other students' views

Using Talk moves in Geography

Focus Area: Engaging with each others' reasoning

Turn	Respondent	Response	Talk move
25	Student (C)	Something like that lah!	
26	Teacher	Alright, thank you, C.	
27	Teacher	**Who can add on to what C has said?**	Guide student to build on another student's view
28	Student (WK)	Part-time jobs? Like they take up other jobs while they wait to go back to the job? But their income will not be as stable, right?	

Strategies to engage students in talk

Strategy	Sample Teacher Moves to Facilitate Discussion
Add on	Let's go down the row… (Let's go down the row and tell me some examples of jobs that are related to tourism) Can you share… (Can you share some more examples of what you think are some benefits that tourism can bring, apart from earning a higher income?)
Wait time	I will now give you 1 minute / 30 seconds (depending on complexity of task) before you answer (may discuss with partner/group) Remember , I'm not looking for speed ☺ No prizes for being first

How talk moves impacted student learning

- Students are better prepared to share their views/opinions in class.
- Students learn to understand and appreciate diverse perspectives and to use them in formulating their own opinions/arguments.
- Richer discussion - more is learnt during such classroom interactions.
- Student are better able to question the validity/usefulness of sources. This shows deeper understanding of sources.

Language support for students

- Prompt phrases to show opinion/argument.
- Language structures to help them better organise opinions and arguments (the use of discourse markers).
- Examples of questions to clarify their understanding.

Mathematics

by Mrs Tan Li Pei

Anchor Tasks

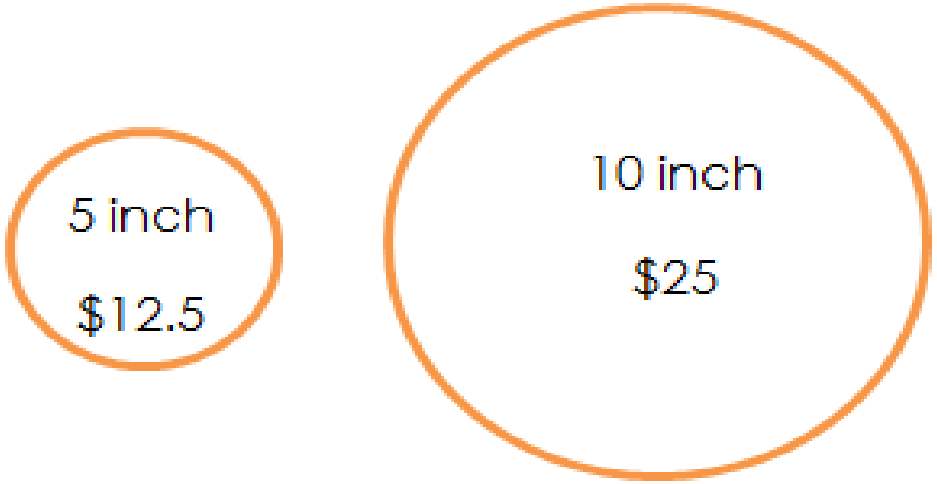
Main learning tasks that **introduce**
and/or **consolidate** a new mathematical concept.

Aim to teach mathematics via a **problem-solving approach**.
Promote conceptual understanding of mathematics via a **constructivist approach** (Bruner, 1960).

Emphasize **mathematical reasoning and communication** while nurturing desired learning dispositions such as **critical thinking**, **metacognition** and **problem-solving heuristics**.

Let's Think Mathematically!

Secondary 3 Express Chapter 4 Conditions of Similarity



Sample Anchor Task 1

(Diagrams are not drawn to scale)

1. The diagram above shows a 5 inch pizza and a 10 inch pizza priced at $12.50 and $25 respectively. The pizzas are famous for their thin crusts and bases.

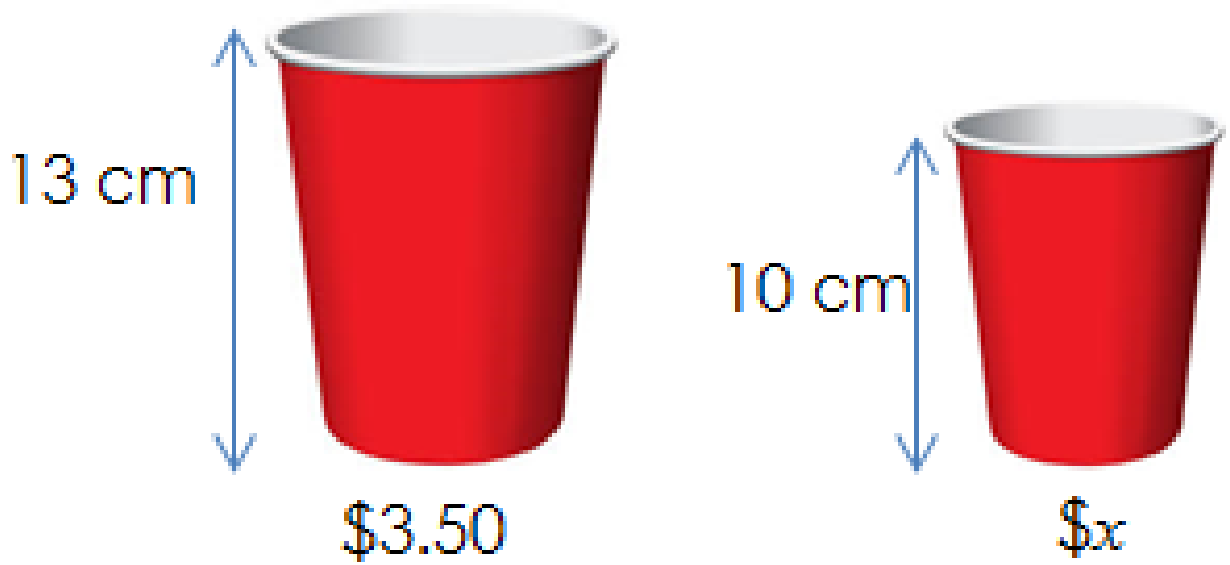
   Explain mathematically if it is equal in monetary value to purchase 2 of the 5 inch pizzas as a 10 inch pizza.

Students @ Work

Thinking and communicating mathematically

Let's Think Mathematically!

2. The pizza shop would like to price its 2 different cup size of drink fairly for its customers. Suggest the value of x, rounded off to 2 decimal places for the shop if the 2 cups are geometrically similar.



Sample Anchor Task 2

Task Extension

"With reference to the real world context, why do you think there is a demand for the pricing strategy used in Q1?"

How talk moves impacted student learning

- Learning is social and peer interactions help extend learning in the classroom.
- Rich tasks are helpful in engaging the students.

Support for productive academic discussions

- Strong content mastery to deal with students' responses, especially unexpected responses.
- Good facilitation skills, namely, in the productive talk moves.
- Tasks with clear instructional and learning outcomes.

Using Talk Moves in the Physics Classroom

by Ms Vino Selveindran

Class: Sec 3 (Express)

Topic: Kinematics

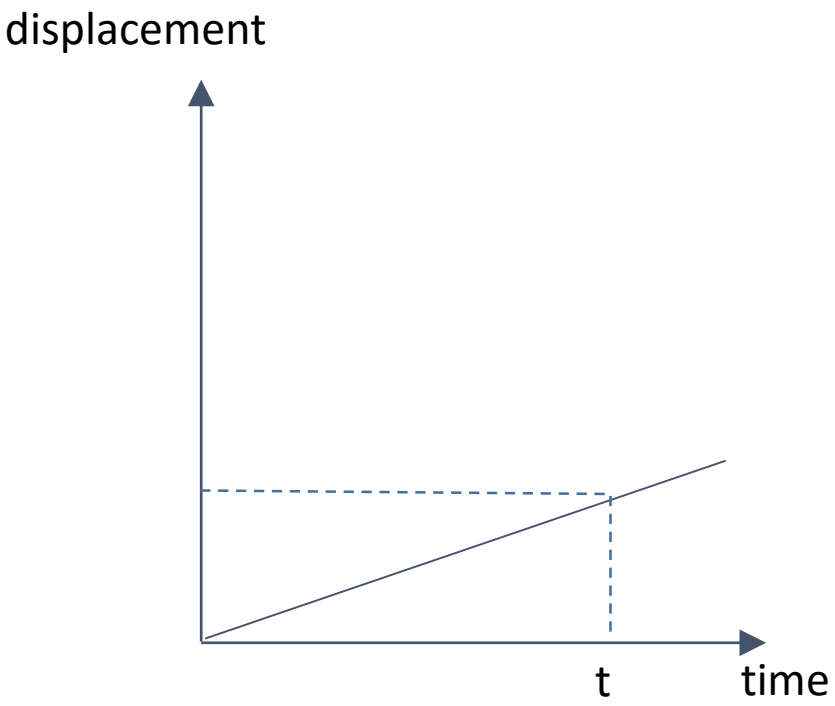
Learning Objectives:

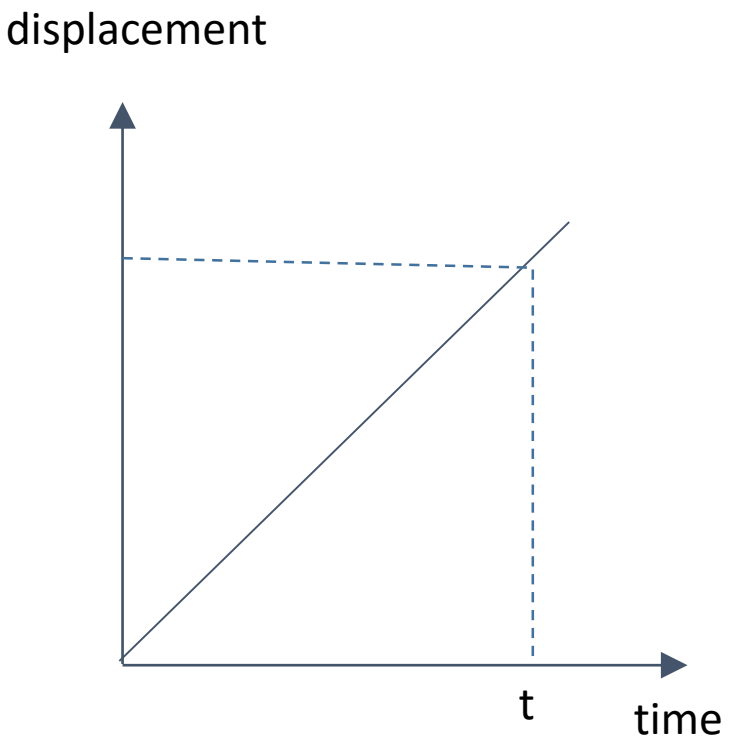
1. Deduce from the shape of a **displacement-time** graph when a body is
   a) at rest
   b) moving with uniform **velocity**
   c) moving with non-uniform **velocity**

2. Deduce from the shape of a **velocity-time** graph when a body is
   a) at rest
   b) moving with uniform **velocity**
   c) moving with uniform acceleration
   d) moving with non-uniform acceleration

Using Talk Moves in the Physics Classroom

LO: Deduce from the shape of a **displacement-time** graph





With reference to Transcript (Page 1)

Using Talk Moves in the Physics Classroom

LO: Deduce from the shape of a **displacement-time** graph

1	Teacher	Take a look at the two displacement graphs. What do you think are the similarities between the two?	Probe for Reasoning
2	Std A	Both graphs show objects that have increasing displacement with time.	
3	Teacher	Good answer! Now can someone share the differences between the graphs?	Probe for Reasoning
4	Std B	The displacement on the left graph seems to be increasing slowly as compared to the right.	
5	Teacher	What makes you say so?	Seek clarification
6	Std B	For the same amount of time, the left graph shows less displacement travelled compare to the right graph.	

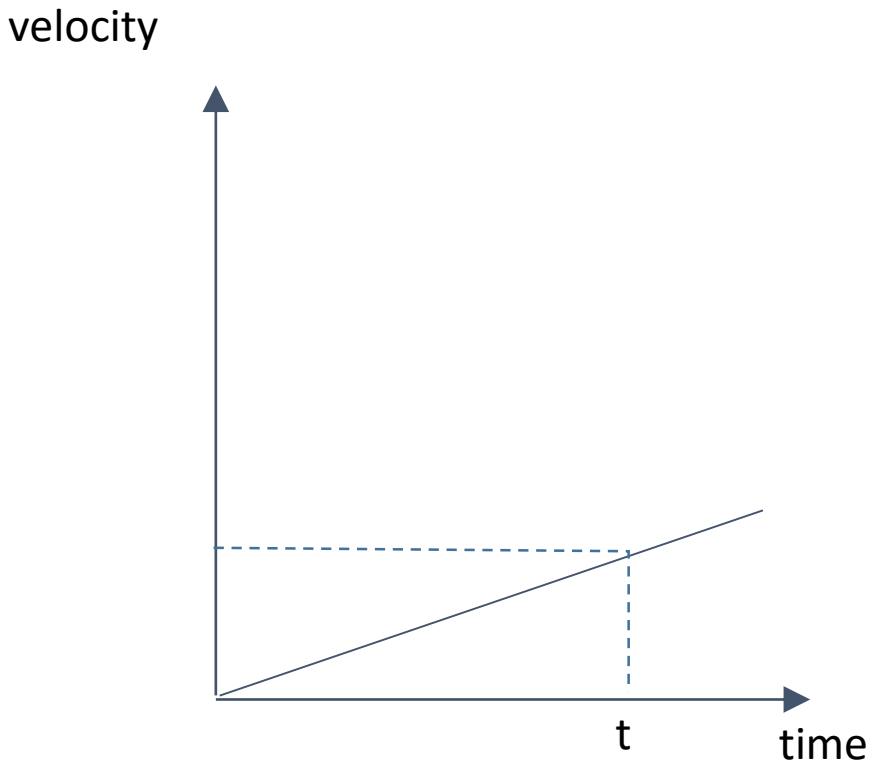
Using Talk Moves in the Physics Classroom

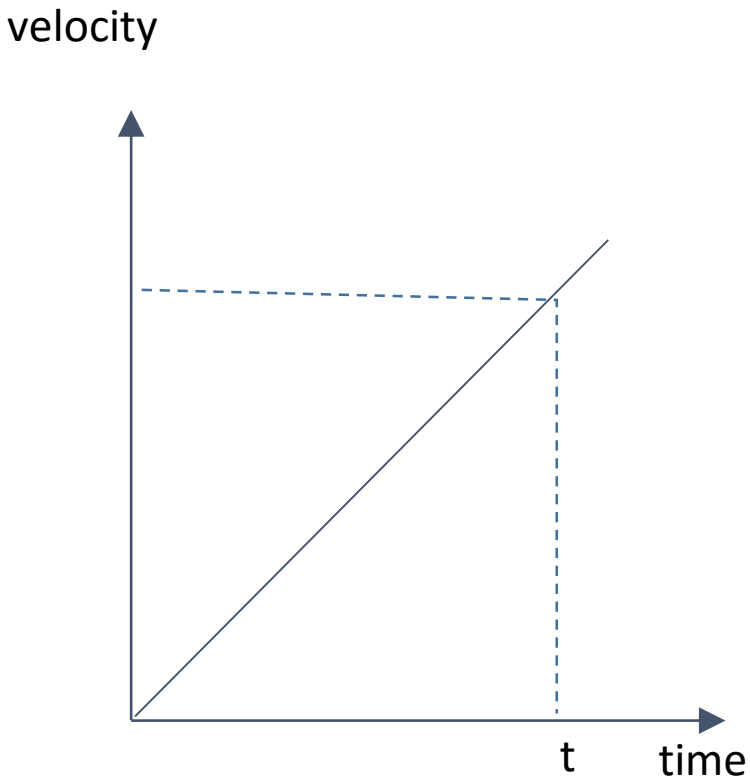
LO: Deduce from the shape of a **displacement-time** graph

7	Teacher	So you are saying that the left graph shows a slower motion as compared to the graph on the right, as for the same amount of time, the left graph shows a smaller displacement compared with the right graph.	Re-voice for Verification
8	Std B	Yes!	
9	Teacher	So this means that a body with a slower motion have a lower velocity. Can anyone share what you notice about the left graph compared to the right graph in terms of its slope?	Probe for reasoning
10	Std C	Left graph is less steep compared to right graph.	

Using Talk Moves in the Physics Classroom

LO: Deduce from the shape of a **velocity-time** graph





With reference to Transcript (Page 2)

Using Talk Moves in the Physics Classroom

LO: Deduce from the shape of a **velocity-time** graph

1	Teacher	Now, let's take a look at another type of graph: velocity-time graphs. Given what we have discussed regarding slope and gradient so far, how can we compare these two graphs?	Probe for reasoning
2	Std B	The graphs have different gradient. The left graph shows a gentle gradient whereas the right graph shows a steeper gradient.	
3	Teacher	Good observation! With this observation, can someone comment on the change in velocity in the left graph compared to the right graph for the same duration?	Guide students to build on other students' contributions.

Transcript (Page 2)

Using Talk Moves in the Physics Classroom

LO: Deduce from the shape of a **velocity-time** graph

4	Std C	I observe that the object for the left graph has a smaller change in its velocity compared to the object for the right graph for the same duration. This means that the left graph indicates a lower acceleration than the right graph.	
5	Teacher	Thanks Std C! Could you help the class connect what you just shared with what Student B shared about the graph?	Ask students to restate another student's contribution
6	Std C	Std B shared that the left graph is less steep compared to the right graph. A less steep graph in a velocity time graph means that the body has a lower acceleration. Hence, the gradient of a velocity-time graph will indicate the acceleration of the object	

Using Talk Moves in the Physics Classroom

Focus Area 3: Deepening individual students' reasoning		
Talk Move	**Frames for prompting (Teacher)**	**Frames for Responding (Student)**
Probe for reasoning or evidence	Why do you think that?	The way I could tell was because …
	What convinced you?	The data shows me …
	How did you come up with that answer/ solution?	In the graph, it says that …
	How can you support that?	According to my observation ...
	Are you able to show me how?	To demonstrate, what I did was …

How talk moves impacted student learning

- Students are more engaged in their learning.
- Students are able to apply what they have learnt.
- Students are able to articulate and explain what they learnt.

Support for productive academic discussions

- Positive learning environment where everyone is to learn and mistakes are allowed.
- Good listening and communication skills.
- Familiar with talk moves for a meaningful discussion.

Facilitating a Productive Academic Discussion

really takes

proper planning & **iterative cycles**

SELF AWARENESS

Which talk moves do *you* use?

EVALUATION

What talk moves do you think you should use more often? Why?

ACTION PLANNING

How do you incorporate these talk moves into your classes while still focussing on the **academic content** and **learning outcomes** ?

Our duty as teachers is to prepare, to our utmost abilities, each student for a successful life.

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