

# Saint Andrew's Junior School Science Department

**Mission:** To develop each Science pupil to be an inquirer, innovator and environmentalist

**Vision:** Inculcate in pupils a sense of wonder/curiosity and equip them with skills in exploring and discovering such that they aspire to make a positive impact in future



# Nurturing the Holistic Thinker

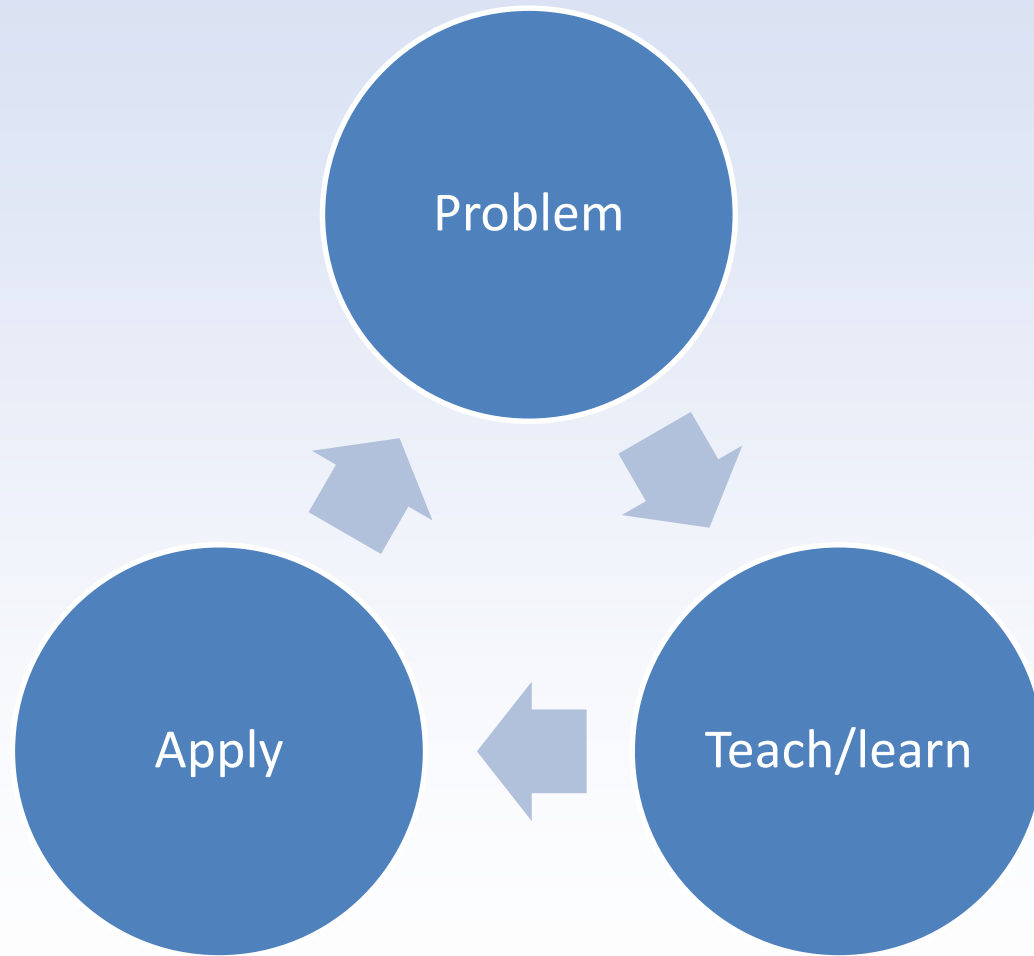
Pedagogy: What IS in our school?



Dept pedagogy remains- only change is addition of "challenge" to the problem

# Science Pedagogical Process Flow

## Problem (P), Teach/learn (T), Apply (A)



# P: Problem

Name: \_\_\_\_\_ Class: P6 \_\_\_\_\_  
Date: \_\_\_\_\_

Problem (Forces)

You have been tasked by the government to create a high speed rail system that can travel at a high speed. In your initial presentation you will need to state the problems encountered in the creation of this high speed rail. Address the problems associated with:

1. Reducing or increasing friction.
2. Reducing or increasing weight.
3. Any use of elastic spring force? If yes, where/ how?
4. Any use of magnetic force? If yes, where/how?



The boys will be given a problem to solve/challenge.  
The problem usually will be set in a real world context to provide authentic learning and problem solving experience.



# T: Teaching and Learning

Section 2: Effect of lubricants/ball bearings/ wheels

**Aim:** To find out the effect of ball bearings (marbles) on the amount of friction between two surfaces.

**Materials needed:** Milk tin or any similar tin with lid, some marbles and an A4 sized book.

**Procedures**

1. Put a milk tin with a lid on the table.
2. Place an A4-sized book on top of the tin.
3. Try to spin the book by pushing it in a clockwise direction.



4. Observe what happens.
5. Remove the book from the top of the milk tin.
6. Now put marbles all around the lid so that they are resting on the groove between the lid and the rim of the tin.
7. Gently place the book on top of the marbles.



8. Try spinning the book again by giving it a push in the clockwise direction.
9. Observe what happens this time.

**Questions**

1. Was it easier to spin the book when there were no marbles compared to when there were marbles on the rim of the tin? Explain.

2. What happened to the amount of force required to spin the book after the marbles were placed on the rim of the tin? Explain.

3. The marbles acted like ball bearings, or small smooth metal balls placed between the moving parts of machines.

(a) How do you think this is useful for machinery to work?

(b) State three examples of where ball bearings are used to reduce friction.

4. The following demonstrates a real life application of magnets.



Explain how does the above reduce friction.

mc Marshall Cavendish Education

www.mc.edu.sg www.facebook.com/mceducation

**Forces**

- Interactions can be caused by **forces**.
- A force is a **push** or a **pull**.



© 2018 Marshall Cavendish Education | Cambridge

Pupils are required to conduct their own experiments, make observations and try to explain what they observed.



# A: Application

Name: \_\_\_\_\_ Class: P6 \_\_\_\_\_

Date: \_\_\_\_\_

## Apply (Forces)

You have been tasked by the government to create a high speed rail system that can travel at a high speed. In your initial presentation you will need to state the problems encountered in the creation of this high speed rail. Address the problems associated with:

5. Reducing or increasing friction.
  
  
  
  
  
  
  
  
  
  
6. Reducing or increasing weight.
  
  
  
  
  
  
  
  
  
  
7. Any use of elastic spring force? If yes, where/ how?
  
  
  
  
  
  
  
  
  
  
8. Any use of magnetic force? If yes, where/how?



Students have to apply what they have learnt from their investigation and draw a conclusion to help them create a solution to the problem posed.

# National Approach

## 5Es pedagogical approach

- Engage
- Explore
- Explain
- Elaborate
- Evaluate



# Developing the Skilled Communicator



**Presentations**

**Group work**





# Assessment

Term 1	Term 2	Term 3	Term 4
<p><b><u>Topical Review</u></b></p> <ul style="list-style-type: none"> <li>Week 6 (Forces)</li> </ul> <p><b><u>Practical Assessment (Formative)</u></b></p> <p>P3-P5 Topics P6 Topics – Forces, Type of forces</p>	<p><b><u>Semestral Assessment 1</u></b> (100%)</p> <ul style="list-style-type: none"> <li>Booklet A, 28 MCQs (56 marks)</li> <li>Booklet B, 12-13 OEs (44 marks)</li> <li>Total: 100 marks</li> <li>Duration: 1h 45 min</li> </ul> <p><u>Topics</u></p> <p>P3 – Diversity, Systems, Interactions P4 – Cycles, Energy P5 - Cycles, Systems P6 – Interactions</p>	<p><b><u>Preliminary Examination</u></b></p> <ul style="list-style-type: none"> <li>Booklet A, 28 MCQs (56 marks)</li> <li>Booklet B, 12-13 OEs (44 marks)</li> <li>Total: 100 marks</li> <li>Duration: 1h 45 min</li> </ul> <p><u>Topics</u></p> <p>P3 – Diversity, Systems, Interactions P4 – Cycles, Energy P5 – Cycles, Systems P6 – Energy, Interactions</p>	<p><b><u>PSLE</u></b></p> <ul style="list-style-type: none"> <li>Booklet A, 28 MCQs (56 marks)</li> <li>Booklet B, 12-13 OEs (44 marks)</li> <li>Total: 100 marks</li> <li>Duration: 1h 45 min</li> </ul> <p><u>Topics</u></p> <p>P3 – Diversity, Systems, Interactions P4 – Cycles, Energy P5 – Cycles, Systems P6 – Energy, Interactions</p>



# Format of PSLE Science

Booklet	Item Type	No. of Questions	Weightage	Duration
A	MCQ	28	56%	1h 45min
B	Open-ended/ Short-answer	12-13	44%	



# Resources

- Class Science Website
- Science Notes
- Weekly MCQ on class department website
- <https://tinyurl.com/2018sajsP6Sc>
- Supplementary Lessons
  - Answering techniques
  - P.R.I.D.E

## Guide books

- Science PSLE Revision Guide



# Home routines that can support learning of Science

- Linkage of Science to everyday activities or phenomena.
- Guide him in research – information from books / websites
- Ensure that he completes all assignments / corrections.



