

St. Anthony's Primary School

Primary 4

Science

Does it MATTER?

Outline

Lesson Study Cycle

MYE Question analysis

Approaches

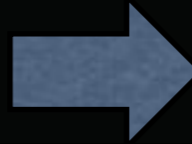
EOY Question analysis

Teachers' reflections

Lesson Study Cycle

A) Preparation Phase

- ❖ Study curriculum, instructional materials, standards and data
- ❖ Discuss and set the long & short term goals
- ❖ Select subject, topic, unit & lesson
- ❖ Plan, prepare and refine the research lesson that achieves and progresses towards the ST & LT goals
- ❖ Anticipate student thinking
- ❖ Plan data collection and lesson schedule
- ❖ Conduct briefing for observers



B) Research Lesson (RL)

- ❖ A RL team member conducts the specific RL
- ❖ The other RL participants comprising the RL team and invited visitors will examine the teaching & learning processes in the classroom



C) Post-RL

- ❖ The RL participants will discuss about the RL findings and the extent the RL achieved its goals
- ❖ What are the implications for this unit and more broadly?
- ❖ What learning and new questions do we want to carry forward in our work?
- ❖ The RL plan & findings will be collated and re-taught OR
- ❖ Begin a new LS cycle for a new topic

Buzz Time

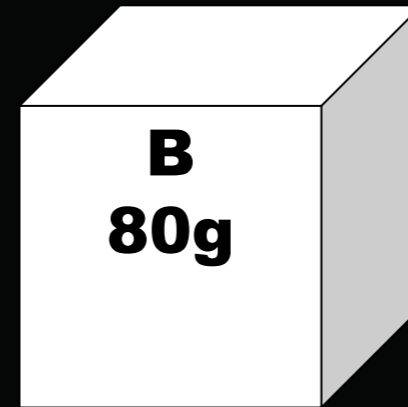
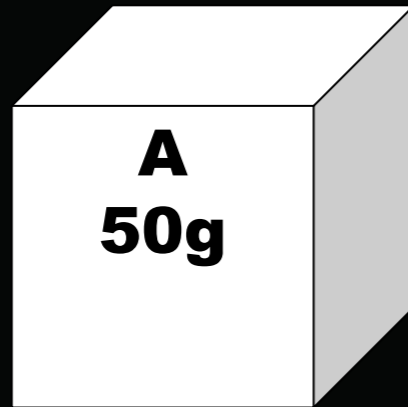
Do these 2 cubes have the same mass?

Do they have the same volume?



Mid-Year Examination

Alan carried out the following activity. He used 2 solid metal cubes of the same shape and size as shown in the diagram below.



When he lowered Cube **A** gently into a measuring cylinder containing 30 cm^3 of water, the water rose up to 45 cm^3 .

Alan then carefully put in Cube **B** into an identical cylinder containing 30 cm^3 of water .

Will the water level be the same, higher or lower than when Cube **A** was put into the water?

Misconception:

Cube with bigger mass has bigger volume



A
50g



B
80g

Approaches



**6 Scientific
Methods**



Questioning



**Hands-on
experiences**

Tuning-in

- Recapitulation

Activities

- Observation
- Hypothesis
- Experimentation
- Data analysis

Conclusion

- Reflection

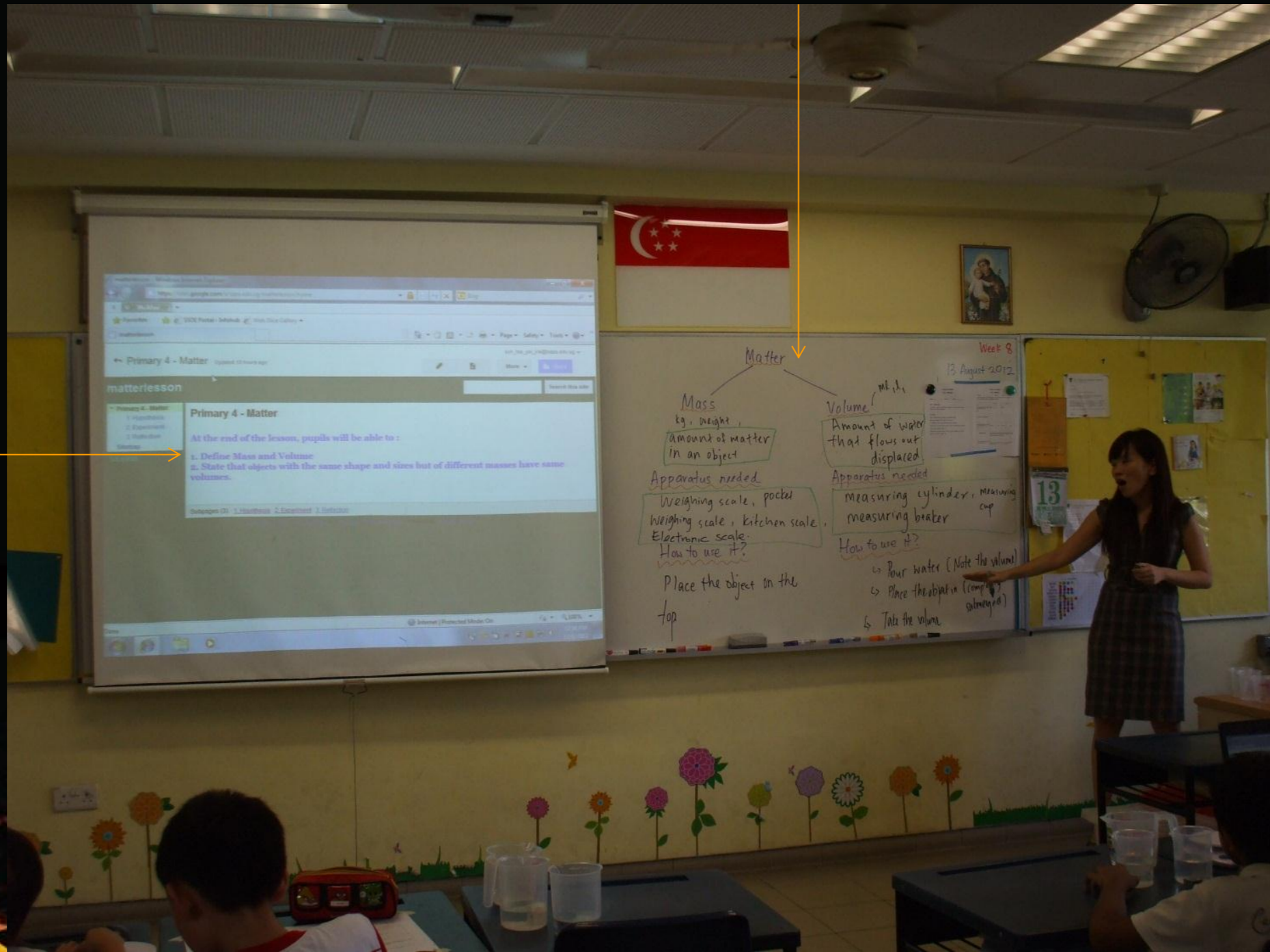
6 Scientific Methods

Tuning-in

- Inform objectives of lesson (*Google site*)
- Use of mind map to recap and reinforce (*Whiteboard*)

Mind map

Objectives



Mind Map

Matter

Mass

Volume

Apparatus
needed

Apparatus
needed

How to use

How to use

9. Each group will be given 2 different types of material with different mass but same shape.

10. Pupils will be asked which object has a bigger mass.

T: Here are 2 similar objects. What apparatus should we use to measure the mass of the objects?

Possible pupils' responses

weighing scale

Scaffolding: if student answers balance, ask them whether it can give the exact measurement.

T: Can anyone tell me which of these 2 objects have a bigger mass?

Possible pupils' responses

Object A

T: What about their volumes?

T: Take 1 min to discuss in your group if you think that volume of object A is the same as, bigger or smaller than volume of object B?

T: Type your group response into Google form under hypothesis

This will serve as your hypothesis so now

CoL

Contributing ideas and considering others' point of view

Think-three-share

“...questions posed at critical junctures of a lesson can focus students’ attention on the critical aspects of the object of learning, and open up the space for further inquiry and learning...” Tsui, Marton, Mok and Ng (2004)

Matter

Mass

kg, weight,
amount of matter
in an object

Apparatus needed

Weighing scale, pocket
weighing scale, kitchen scale,
Electronic scale.

How to use it?

Place the object on the
top

Volume ^{ml, l,}

Amount of water
that flows out
displaced.

Apparatus needed

measuring cylinder, measuring
measuring beaker cup

How to use it?

- ↳ Pour water (Note the volume)
- ↳ Place the object in (completely submerged)
- ↳ Take the volume (subtract the volume of water)

Week 8

13 August 2012





Activities

- Observation
- Forming hypothesis (*Google form*)
- Hands-on (*Whiteboard*)
- Record data (*Google form*)
- Draw conclusion using the data (*Google form*)

Hypothesis

A	B	C	D	E
	Names of group members	Which object, A or B, has a bigger mass?	2) How about their volumes? Do you think that Object A has a	3) Explain your answer to question 2)
HA	Yun chuan ,melissa,yee shing	A	they have the same volume	they have the same shape and size
HA	Ada,Kelvin,Nathan	Object A	Both have the same volume.	Both have the same shape and sizes.
LA	gwendolyn,danish,jaga,yin xian.	A	same	because it has the same size and shape.
LA	layla,helmi,aliyah	a	No.	Object A is bigger than object B.
LA	kylee,shirley,fursham	object A	object A is bigger than object B.	it was because,object B is lighter than A.
MA	Hamizah,Zachary,Zhi hong.	A	Yes.	yes,because they have the same sizes and shapes.
MA	Nicholas, Shawn, Marcus.	A	They have the same volume.	They both have the same size.
MA	Thou Jia Le, Erica Chia, Tang Jing Wen	A has a bigger mass.	We say that Object A has a bigger volume than Object B.	It is because Object A feels heavier than Object B.
MA	Fatin,Bryan,Xavier	A	Object A has a bigger volume than Object B.	I think Object A has a bigger volume because Object A is hea
MA	ryan,megan,wiley	A	A	errrr A has a bigger mass and a bit bigger in size
MA	nicole wong,travis seah,nikita pereira:)	A	object A has bigger volume	It is because object A has bigger volume.It feels heavier tha
MA	Wynn,Maeve,Kader	Object A	Object A and Object B might have the same volume.	As Object A and Object B almost the same size so they take



Hands-on




Crescit Eundo
GROWING AS WE ADVANCE


Hands-on experience

Crescit Eundo
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Google form

 **Name ***


Tristan, Akilan, Shirly

 **Mass of Object A ***


167.5g

 **Mass of Object B ***

82.0g

 **Volume of Object A ***

60ml

 **Volume of Object B ***

60ml



Conclusion

- Use of mind map to reinforce and to link back to objectives (*Google site and whiteboard*)
- Checking understanding of each pupil (*Google form*)
- Reflection (*Google form*)

Reflections

Name	What are some other things you would like to find out about Matter?	What conclusion can you make about the volumes of objects that have different masses, but of the same shape and size?
Kelvin lek	i would like to find out how to measure the volume of an object that floats	the mass of an object does not effect the volume of an object
Tang Jing Wen.	Maybe how to find out a volume of and object when it's floating, like a Ping Pong ball.	The volumes of the objects are exactly the same, but the objects have different masses. The objects have the same size and shape.
Melissa	is a blackhole a matter	they take up the same amount of water.
Erica Chia.	How to find the volume of floatina oboiects.	I felt that Object A is heavier than Object B but it's in the same size and shape.

Tuning -in

- Inform objectives of lesson(Google site)
- Use of mind map to recap and reinforce(Whiteboard)

Activities

- Observation
- Forming hypothesis (Google form)
- Hands-on (Whiteboard)
- Record data (Google form)
- Draw conclusion using the data (Google form)

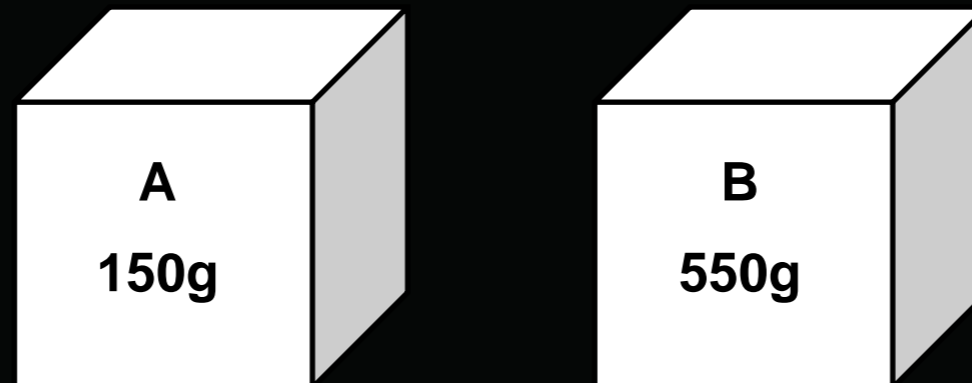
Conclusion

- Use of mind map to reinforce and to link back to objectives (Google site and whiteboard)
- Checking understanding of each pupil (Google form)
- Reflection(Google form)

End-of-Year Paper

Martha carried out an experiment as shown in the diagram below.

She used 2 cubes of identical shape and size but of different masses.



She gently placed Cube **A** into the beaker of water.

Martha found that the volume of Cube **A** is 15 cm^3 .

She then took out Cube **A** and put Cube **B** into the beaker of water.

What is the volume of Cube **B**?

Analysis of questions on Matter

Percentage passes (SA1)	Percentage passes (SA2)
31%	57%

REFLECTIONS OF LESSON STUDY TEAM MEMBERS.....

“.....important to keep the objectives of the lesson in mind as we’re planning to ensure that the lesson focused on the elements that the pupils are having difficulty with...” Lina

“..Pupils enjoyed conducting the experiment as it provided authentic learning....” Iris

*“...The lesson study experience had me stop, think and explore how meaningful learning and teaching can be carried out....”
Lishan*

“...We really got to chance to observe and analyse their actions and thought processes which is a good learning experience for me. ..” Sharon

*“....Working together with teachers in teaching the same subject helped me look at a topic from different angles....”
Usha*

Thank you



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GROWING AS WE ADVANCE

Acknowledgement

Ms Christina Teo, Principal

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Mr Jeffrey Aw, Vice Principal

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Mr Latiff, HOD Sc

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