TEACHING ENQUIRY
with MYSTERIES INCORPORATED

UNIVERSITY of LIMERICK
OLLSCOIL LUIMNIGH

Involving Irish Pre-Service Science Teachers in the TEMI Project

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EPI·STEM
National Centre for STEM Education

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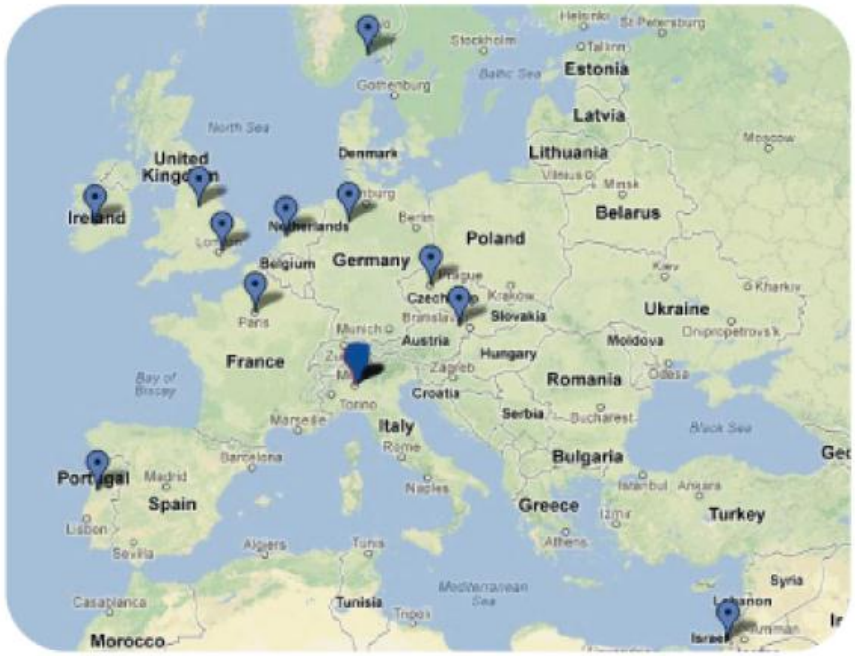
What is TEMI?

- Teaching Enquiry with Mysteries Incorporated
- Funded by the FP7 programme
- Professional Development Workshops
- 12 other European partners



The UL Team

- Peter Childs
- Anne O'Dwyer
- Beulah McManus
- Joanne Broggy
- Orla McCormack

3RD Edition 2014

TEMI: Teaching Enquiry with Mysteries Incorporated

An insight from Ireland

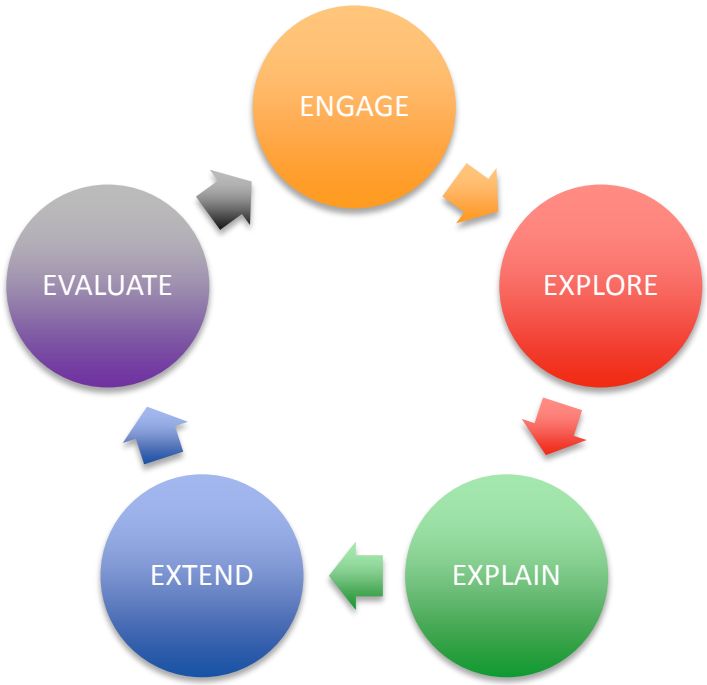
Overview of the TEMI project and structure of CPD in Ireland

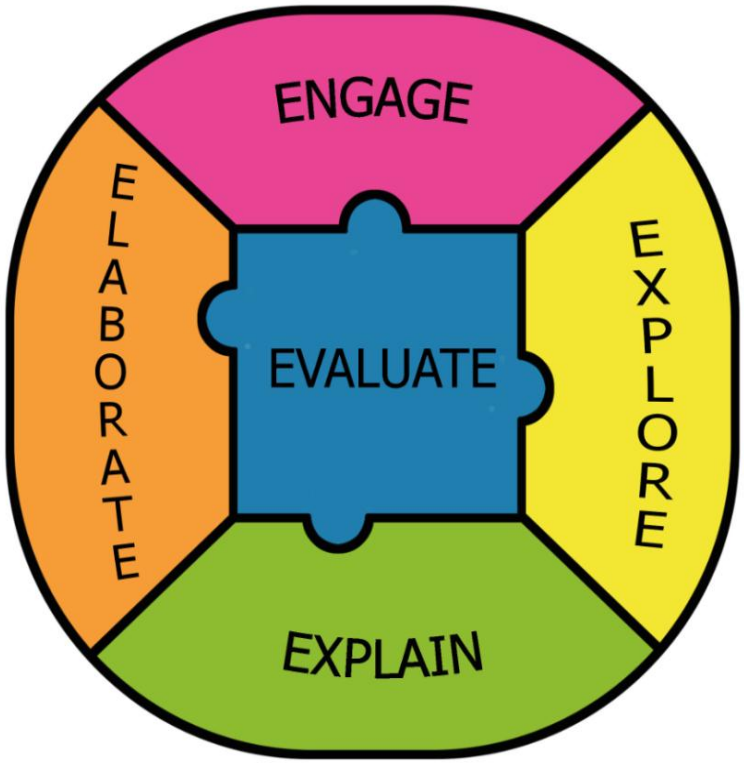
Goals

- Improve science and maths teaching across Europe.
- Focus on pupil enquiry as a driving force for learning.
- Teaching is organised around problems and questions in a highly pupil-centred enquiry process.

http://teachingmysteries.eu/en/

Key Innovations
1. 5 E Model



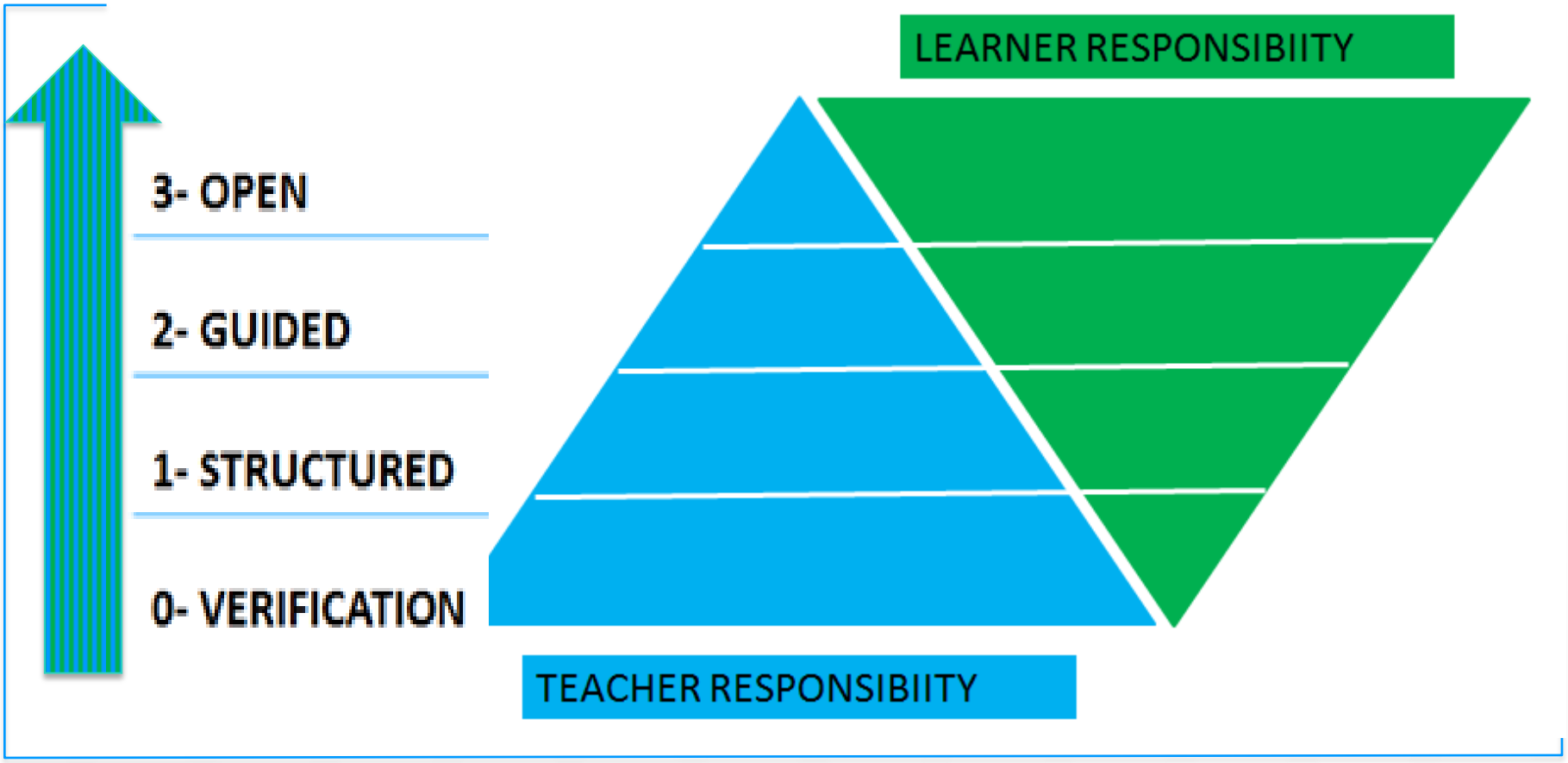


Key Innovations
2. Mysteries

*In science education, a mystery is a phenomenon or event that **provokes the perception of suspense and wonder** in the learner to initiate an emotionally-laden "**want to know"-feeling** which leads to a **raise in curiosity** and which **initiates the posing of questions** to be answered by **inquiry and problem-solving activities**.*

Key Innovations

3. Gradual Release of Responsibility



Key Innovations
4. Showmanship

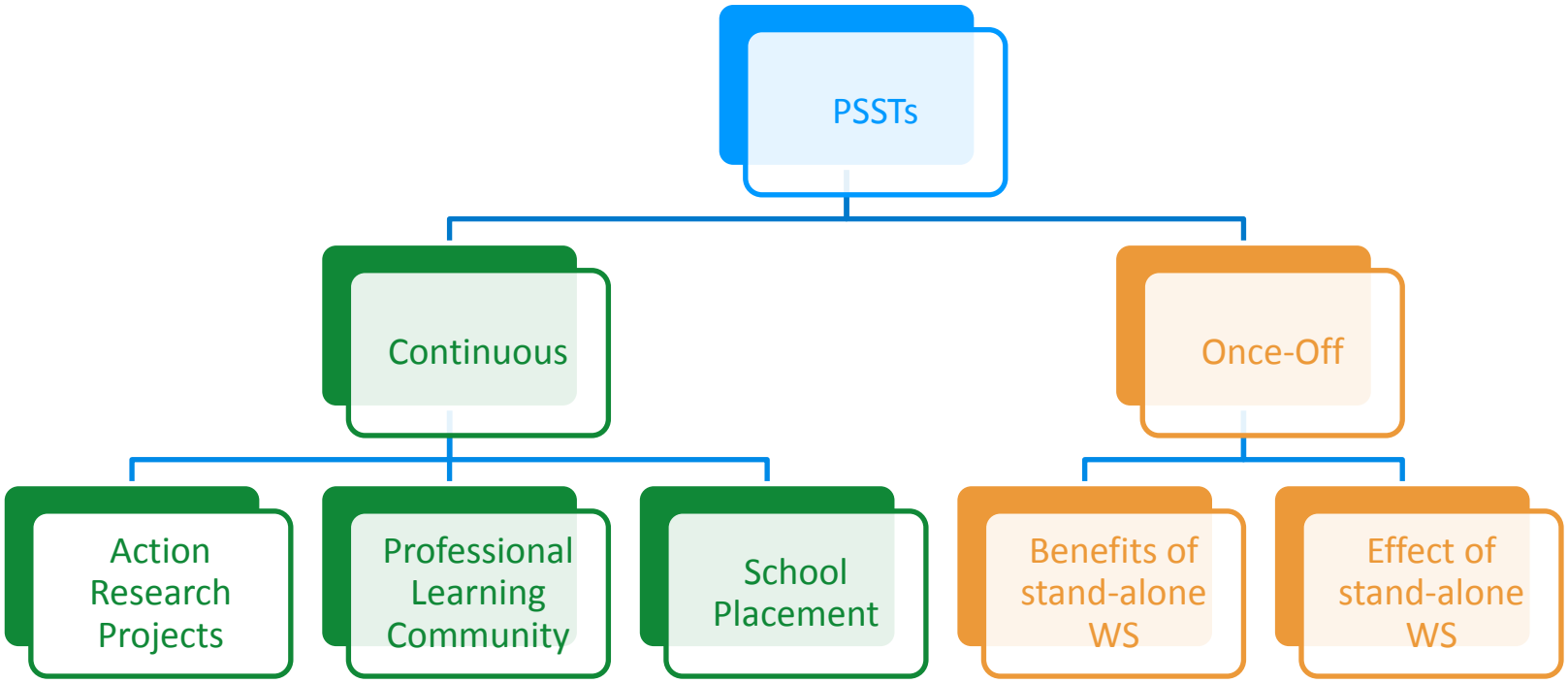
It was a strange gift for Sam to receive. Sam Kennedy is a 24 year old lawyer and his mother is always sending him odd things to 'brighten up his house'. He is very busy, you see, and doesn't always have time to make his house feel…how did his mother put it? Oh yes 'homely', so she takes it upon herself to 'help out' in any way she can.

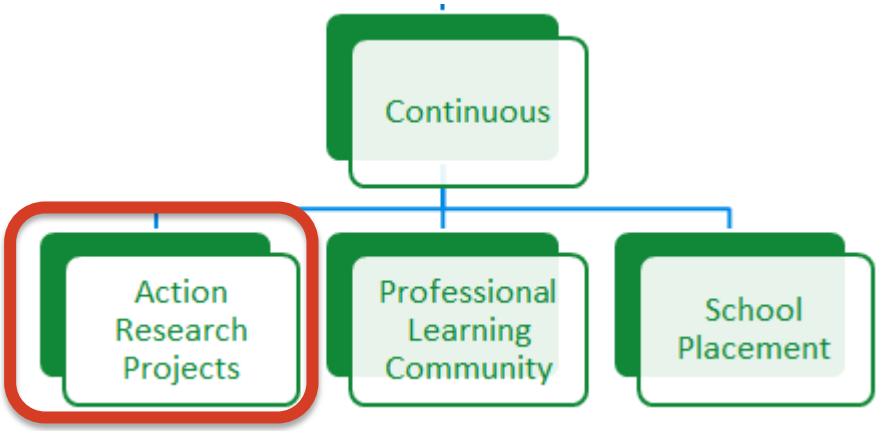
This time it is a plant, well a potted plant.

Teacher Training*(to-date)*

	Cohort 1	Cohort 2	Cohort 3
2013	1.1		
2014	1.2		
2014		2.1	
2015		2.2	3.1
2015			3.2

Role of Pre-Service Science Teachers (PSSTs)

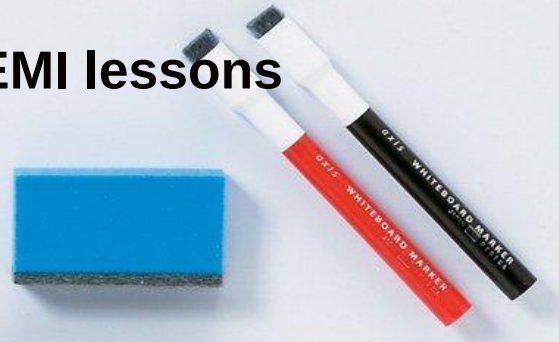




- Compulsory in most undergraduate courses in UL.
- Typically accounts for 3 modules' credits (or more).
- Students study a topic of their own choosing in depth, with support from their chosen supervisor, in their final year of study.
- Must write a thesis report on their study.

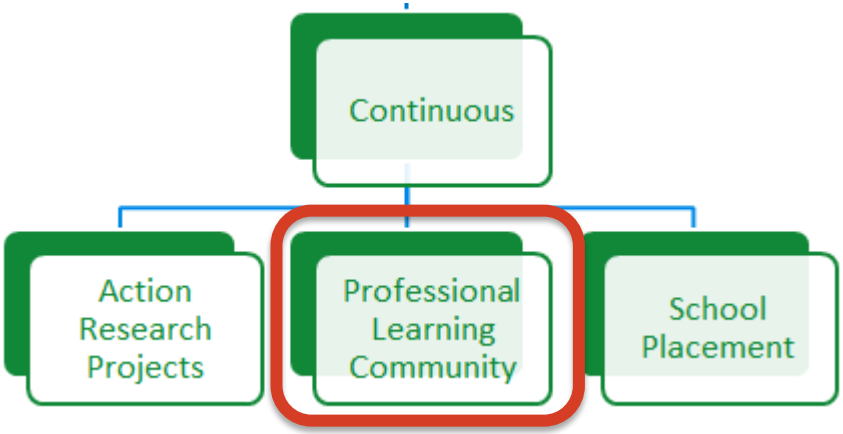
Action Research

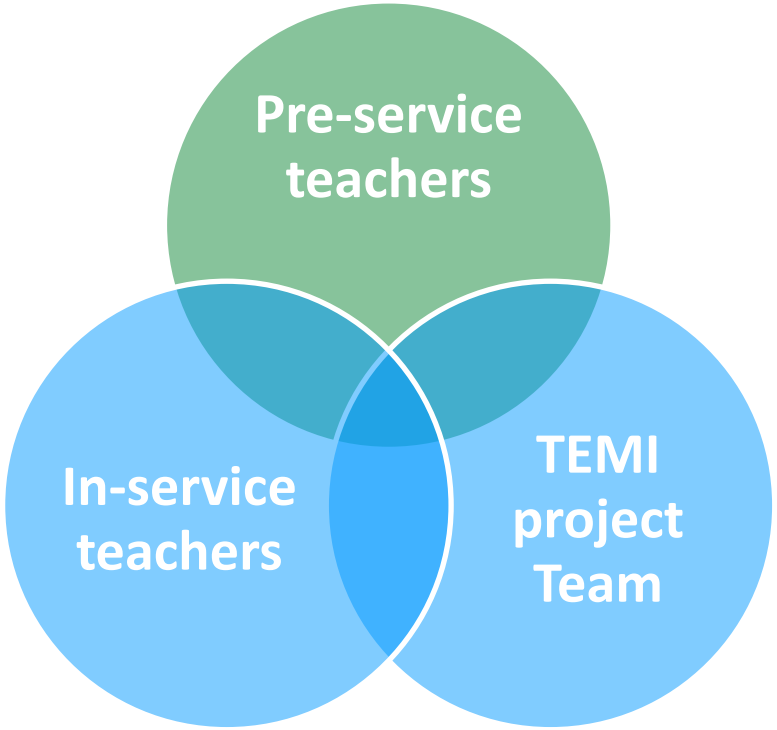
- ✓ **Research discrepant events and their relationship to IBSE.**
- ✓ **Review IBSE in second-level science education.**
- ✓ **Choose subject (biology/chemistry/physics/Transition Year science) on which to focus TEMI lessons.**
- ✓ **Source at least 10 discrepant event ideas in chosen subject and develop TEMI lessons from these.**
- ✓ **Trial a min. of 5 TEMI lessons while on final teaching placement**
- ✓ **Evaluate effectiveness of developed TEMI lessons**



Bank of TEMI Lessons

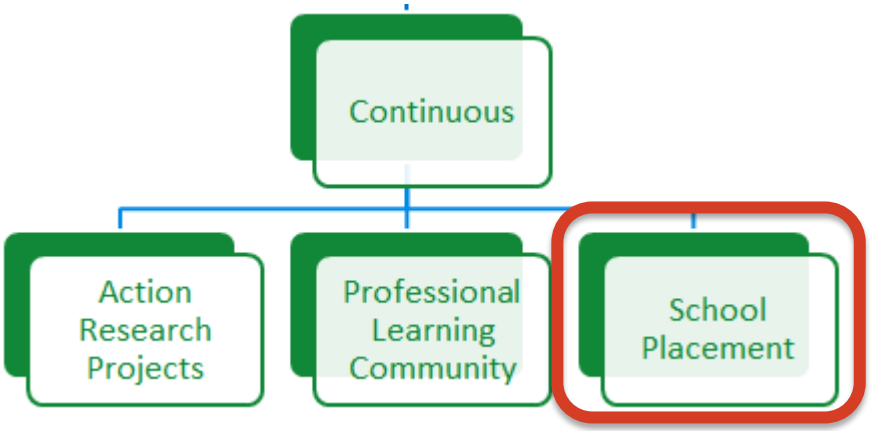
Physics	Chemistry	Biology	All 3 Sciences
• Lower % Upper Second Level • Lesson plans with student activity sheets	• Lower % Upper Second Level • Lesson plans with student activity sheets	• Lower % Upper Second Level • Lesson plans with student activity sheets	• Transition Year • Three 8 week modules


Continuous
Action Research Projects
Professional Learning Community
School Placement

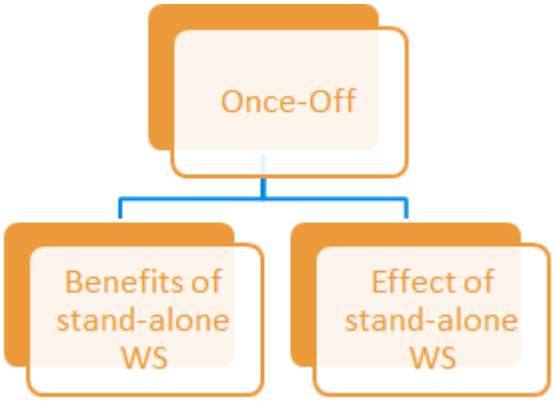

Pre-service teachers
In-service teachers
TEMI project Team

Role of the PSSTs in the PLC

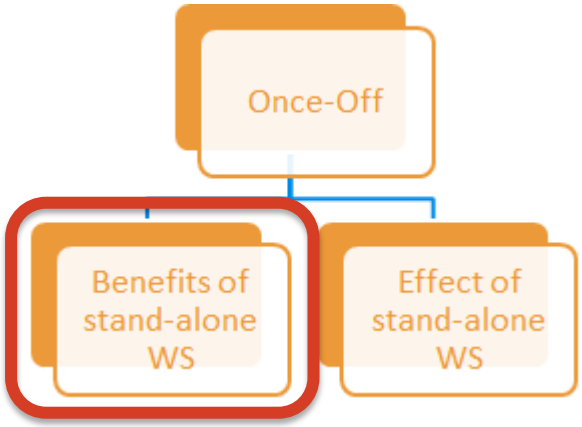
- Attended and participated in TEMI workshops.
- Mentored and facilitated in-service teachers in sourcing and developing TEMI lesson ideas.
- Provided feedback on experiences from school placement.



- Trialling TEMI lessons on School Placement
- Collaboration with co-operating Science Teacher
- TEMI ambassadors
- Effective recruitment of in-service Science teachers for future training



- 3-Hour TEMI workshop
  - Provision of TEMI lesson examples
  - Group work development of own ideas and resources
- Before School Placement
- Introduction to two TEMI Innovations
  - 5 E model of Enquiry
  - Use of Mysteries to engage learners
- N = 38



Learn a way how to structure mysteries into a lesson

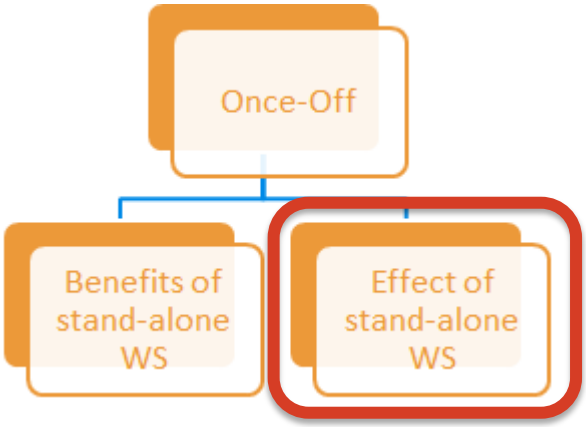
Learn how to ask questions

Learn ideas and activities for lessons

Recognise the importance of pupil engagement

See the benefits of using mysteries as an engagement tool'.

Questionnaires (n=38)



Implementation of TEMI ideas during School Placement

Use of the 5 E planner to facilitate lesson structure and focus

Some challanges when motivating pupils using mysteries

More time to develop TEMI ideas

Be introduced to TEMI sooner in their Science Teacher programme

Have more than one TEMI workshop (beyond initial ideas)

Focus Groups (2 x n=4)

PSSTs

Continuous

- Continue to recruit students for FYRPs
- Collation of data collected to date
- Follow-up with teachers from early cohorts

Once-Off

- Provide TEMI workshop for ALL PSSTs in Year 3 of Science Education programme.
- Embed TEMI innovations in the Science Teacher Training Programme.

- Pre-service science teachers.
- In-service science teachers.
- UL TEMI project team:

  Joanne Broggy

  Peter Childs

  Beulah McManus

  Orla McCormack

All other TEMI partners.