

# Teacher Education Programme

Strategies for  
Assessment of Inquiry  
Learning in Science

**KING'S**  
*College*  
**LONDON**



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**SAILS**  
Strategies for Assessment of  
Inquiry Learning in Science

# Session 3: Crafting Inquiry Pedagogy

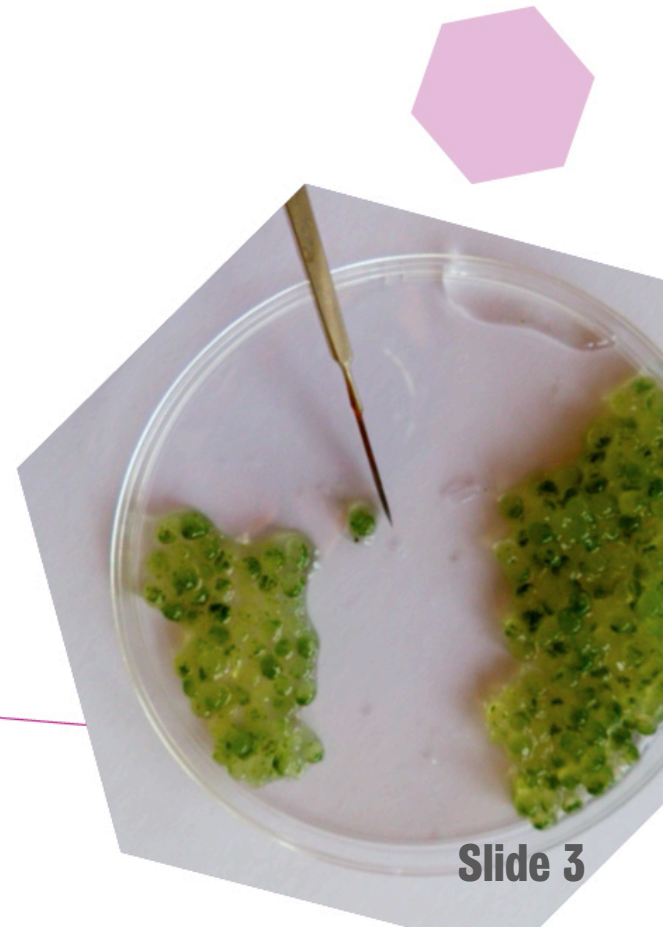


# Objectives of Session

- to share reflections on how successful the inquiry activities were in your classrooms
- to recognise that there is a range of approaches to inquiry that require different amounts of support and lead to different outcomes
- to trial three inquiry units designed to broaden views of what constitutes IBSE
- to analyse how collaborative learning works and think about how to improve their group and teamwork
- to workout how you might use assessment during the inquiry to evidence learning and identify areas for improvement

# Outline of Session

- Reflection on Classroom Inquiries
- Classroom Assessment Model
- Exploring Inquiry Activities
- Collecting Evidence of Learning
- Planning Next Steps



# Teacher Feedback on Classroom Inquiries

- Which inquiries did you try? Why these?
- Which inquiry skills did your students focus on?
- How did your students respond to the inquiry activity?
- What evidence of learning did you notice?
- Which questions did you use to probe students' understanding?

# Findings from the SAILS project

- Collaborative learning is at the heart of inquiry and needs to be planned for and supported by the teacher
- Placemats and Learning Landscapes support data collection for assessment
- Teachers can select whether to make the inquiry activity open, guided or bounded



# Trying out some inquiries

These are 3 inquiry activities, parts of which, require different amounts of guidance from the teacher

- **Collision of an Egg** (see Resource Sheet 3.1 & SAILS website [www.sails-project.eu](http://www.sails-project.eu))
- **Algal Balls** (see Resource Sheet 3.2 & Science and Plants for Schools website [www.saps.org.uk](http://www.saps.org.uk))
- **UV Radiation** (see Resource Sheet 3.3 & SAILS website [www.sails-project.eu](http://www.sails-project.eu))

# Three Inquiry Activities

- Think about and list the inquiry skills involved in each inquiry activity
- Try each inquiry and consider how you might do the activities with your students





# Categories of Inquiry

- Think of each of the inquiry activity as a group of subtasks. What would these subtasks be in each inquiry? Use Resource Sheet 3.4 and list the 2, 3 or 4 subtasks in each of the inquiries
- In each inquiry, decide which subtasks you might need to guide with specific instructions and which you can leave open for students to make the decisions
- Which factors determine how open or how guided a particular subtask is?

# Reflecting on the three inquiries

Wenning categorises inquiry into 3 groups:

- **Bounded inquiry**  
(Teacher makes all decisions)
- **Guided inquiry**  
(Teacher makes some of the decisions)
- **Open Inquiry**  
(Students make all or the majority of decisions)

Where do each of today's inquiries fit in Wenning's categorisation?

# Collaborative Learning

Collaborative learning is when two or more people learn together capitalizing on one another's resources and skills (asking one another for information, evaluating one another's ideas and monitoring one another's work.)

This approach implicitly integrates social and emotional processes with the formulation of knowledge and skill development. It reinforces a socio-cultural model of learning and inquiry.

# Exploring Collaborative Learning

The idea behind this task is to help you think about the benefits of collaborative learning and how your students can develop their social, emotional and logical skills at the same time.

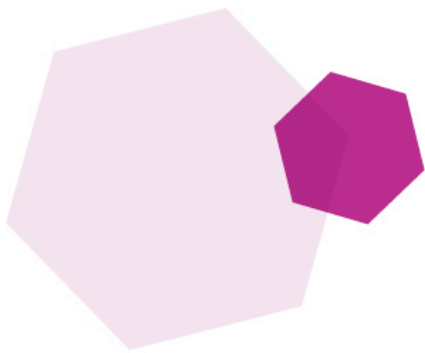
You will need to work in mixed gender groups of 4-6, with an allocated observer

or

have one group of 4-6 people that the rest of the class observes doing the task.

# Collaborative Learning Task

- In a group of 4-6, make a tower to support 100g mass at a height of 52 cms or higher
- Observers use Resource Sheet 3.5 to collect data on the way the group performs the task



# Group feedback on the task

- Group discusses briefly how well they completed the task and how individuals worked with and reacted to one another
- The observers feed back to the group
- Group responds to the feedback and considers how effective they were at working together at solving the task



# Assessment

- The assessment model focuses on formative assessment during the inquiry
- Teachers can then provide feedback and guidance during the inquiry
- Sometimes, teachers also decide to record how well students or groups are doing specific inquiry skills

# Looking for Evidence of Learning

Select one inquiry from today and think about:

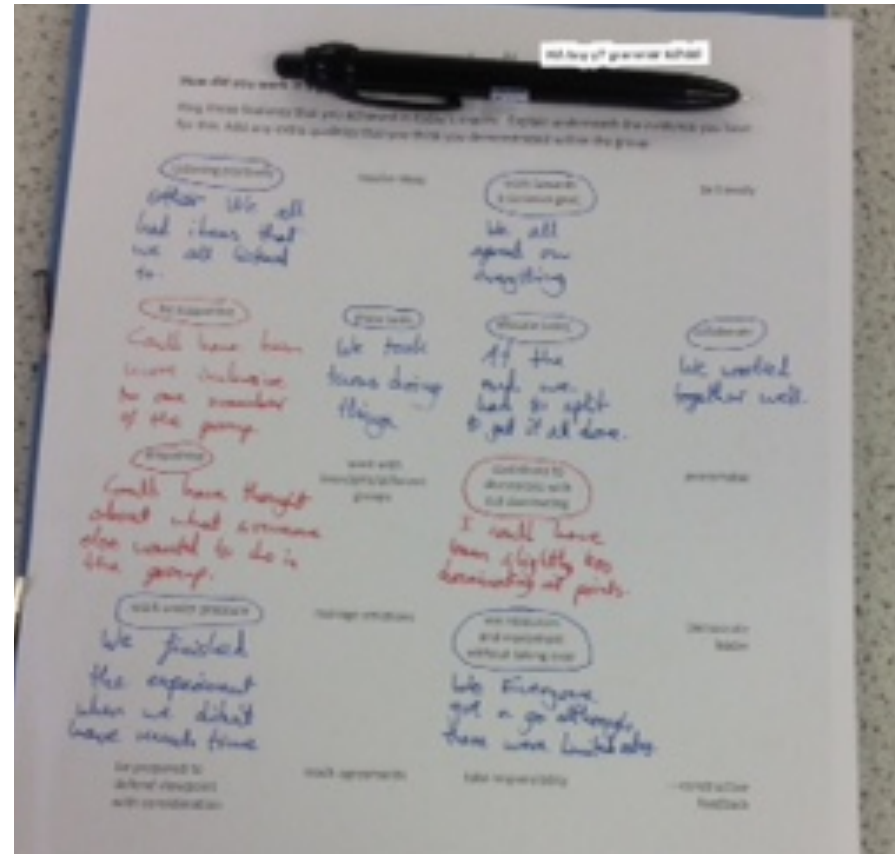
- which questions might you ask during specific subtasks to probe understanding and collect evidence of learning?
- where in the inquiry might you use place mats to collect evidence of learning?

# Learning Landscape

- A Learning Landscape is a tool for recording assessment data and contains descriptions of a range of learning behaviours for a specific inquiry skill
- See Resource Sheet 3.6 for an example of a Learning Landscape

# What is a learning landscape?

- Teachers can use Learning Landscapes to record performance on one or more inquiry activities
- Students might also use this assessment tool to recognise their progress in one inquiry or to map their progress across several inquiry activities



# Planning Next Steps

- Try out one or more of the inquiry activities from today over the next few weeks. Alternatively, develop an inquiry of your own.
- How will you organise and support your class to work well collaboratively?
- How will you assess your students during the inquiry?  
How will you record your judgements?
- What feedback might you need to give during the inquiry?

# References

Wenning C.J. (2007) Assessing inquiry skills as a component of scientific literacy. *Journal of Physics Teacher Education Online*, 4(2), p21-24

