

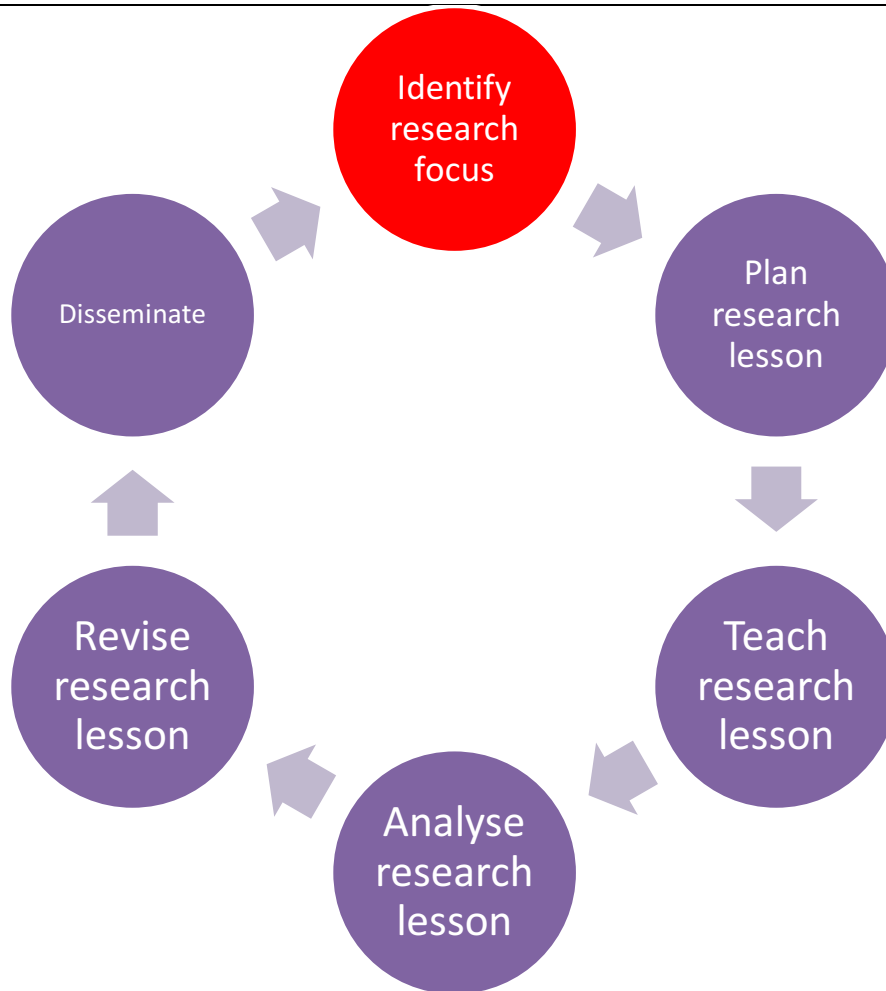


The Lesson Study Process – Algebraic patterns and expressions

Cornerstone Maths Project
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Adapted from Foster, C., Swan, M. and Wake, G. (2015) *The Lesson Study Process Lessons for Mathematical Problem Solving*, Nottingham: The University of Nottingham)

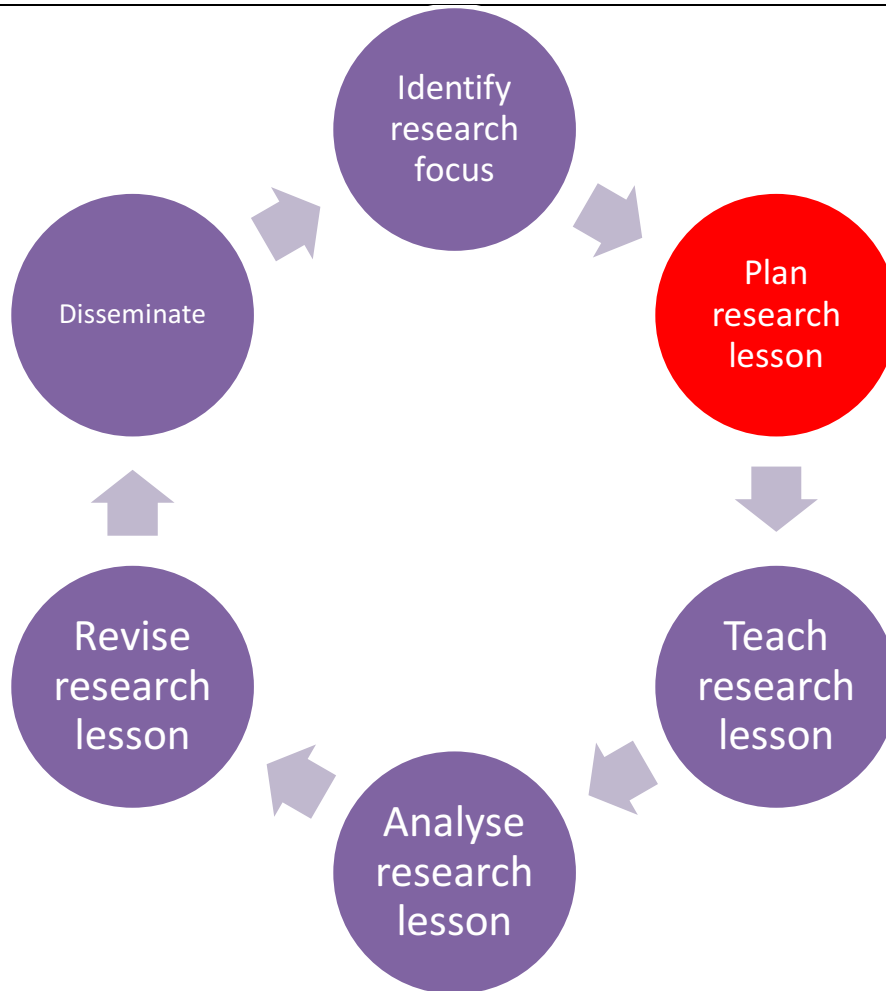
Lesson study cycle



Research focus

To develop pupils' appreciation of an algebraic variable as a dynamic concept.

Lesson study cycle



Teachers collaboratively plan:

The place of the lesson in the sequence

The phases of the lesson and their purpose

The key prompts, questions and actions that are planned

Anticipated pupil responses

Responses to the anticipated pupil responses

Lesson study cycle

CORNERSTONE MATHS

Landmark activity lesson plan

Algebraic patterns and expressions: Investigation 2.1

Research focus: To develop pupils' appreciation of an algebraic variable as a dynamic concept.

Class:

Ability level:

Before the lesson (your preparation):

Pupils' prior experience/skills with the software:

Key learning outcomes for your pupils:

Describe how you will lead you class through Investigation 2.1 in phases:

Phase	What you will do... How you will lead....	Anticipated pupils responses/outcomes
1		
2		
3		
4		
5		

Things not to forget:

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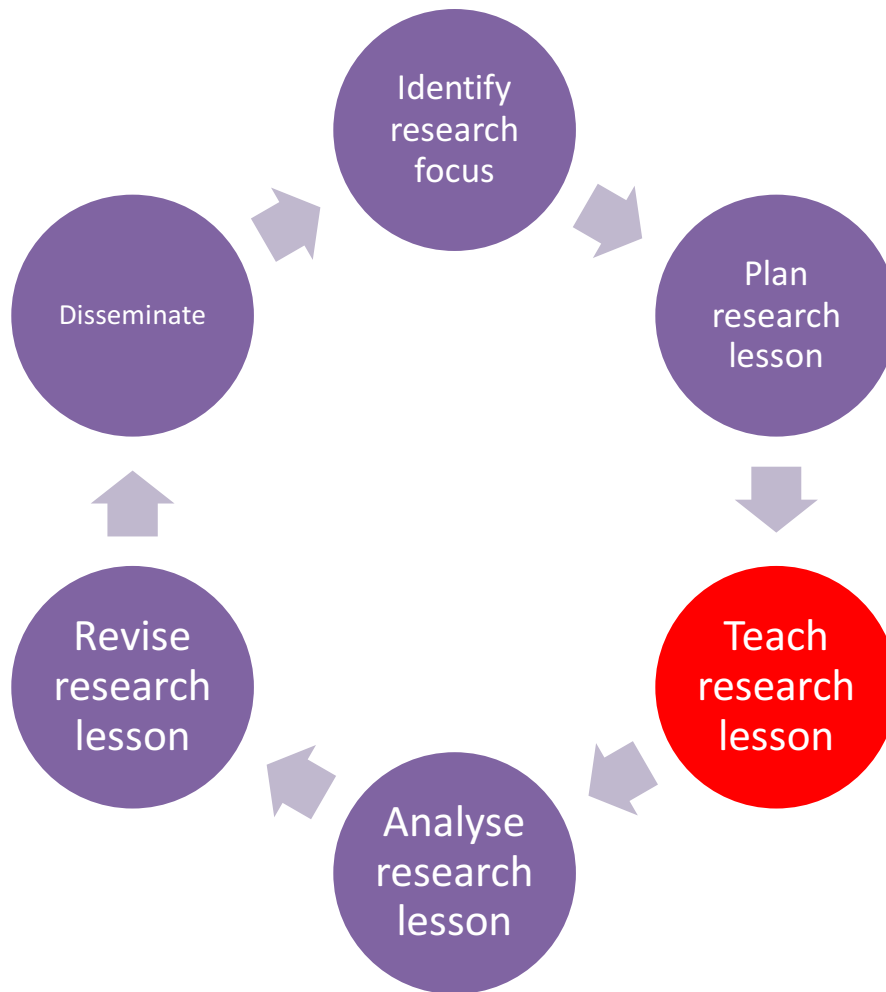
Any planned additional resources (yours):

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When planning be mindful of:

- Noting exactly what YOU will say and do – especially during whole class teaching when you plan to use the software!
- Including descriptions of when and how the pupils will use the software - and how you will support this.
- Keeping the focus on the mathematics – i.e. algebraic variable and how the values of the two variables need to increase/decrease together!
- The vocabulary of the lesson – the maths (variable, multiple, increase, decrease); the technology (light, block, pattern, link etc.) and the context (growing patterns of lights).

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Teach research lesson:

Observe and describe:

Teaching:

What are the most effective prompts, questions and actions?

How was the software used and to what effect?

Learning:

What do pupils discuss?

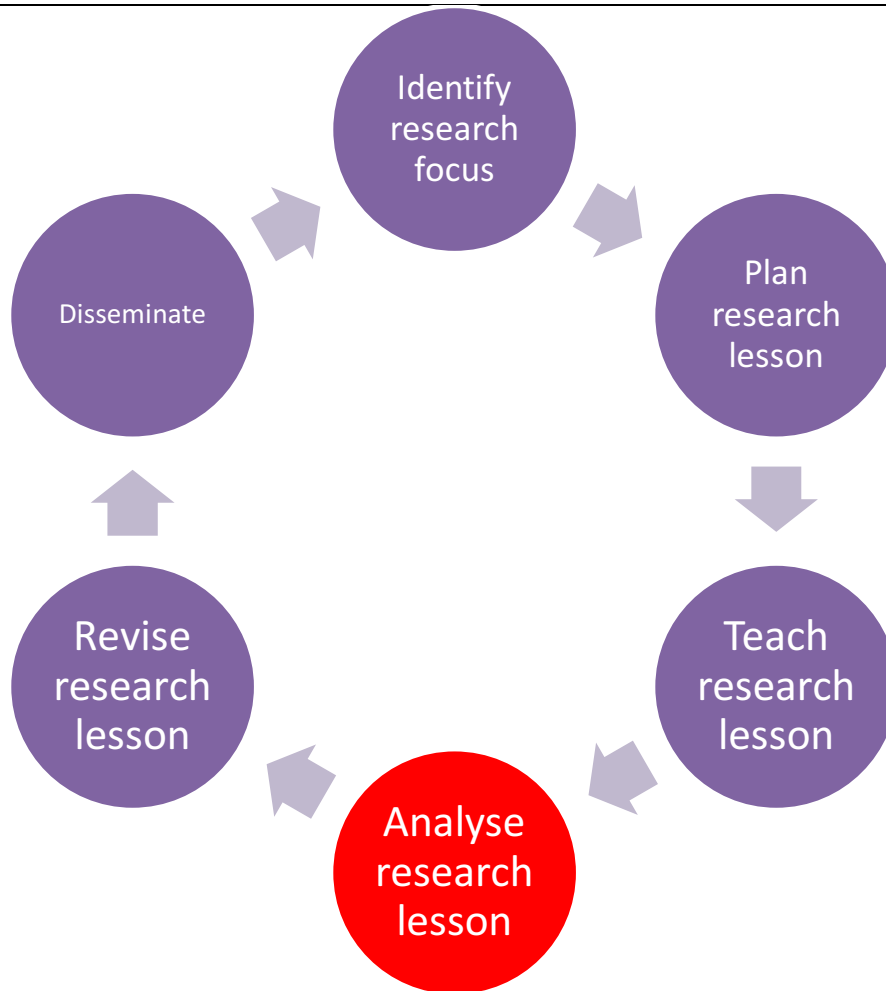
How do pupils reason?

Mathematics:

How does the dynamic concept of a variable develop during the lesson?

What mathematical surprises or challenges do you observe?

Lesson study cycle



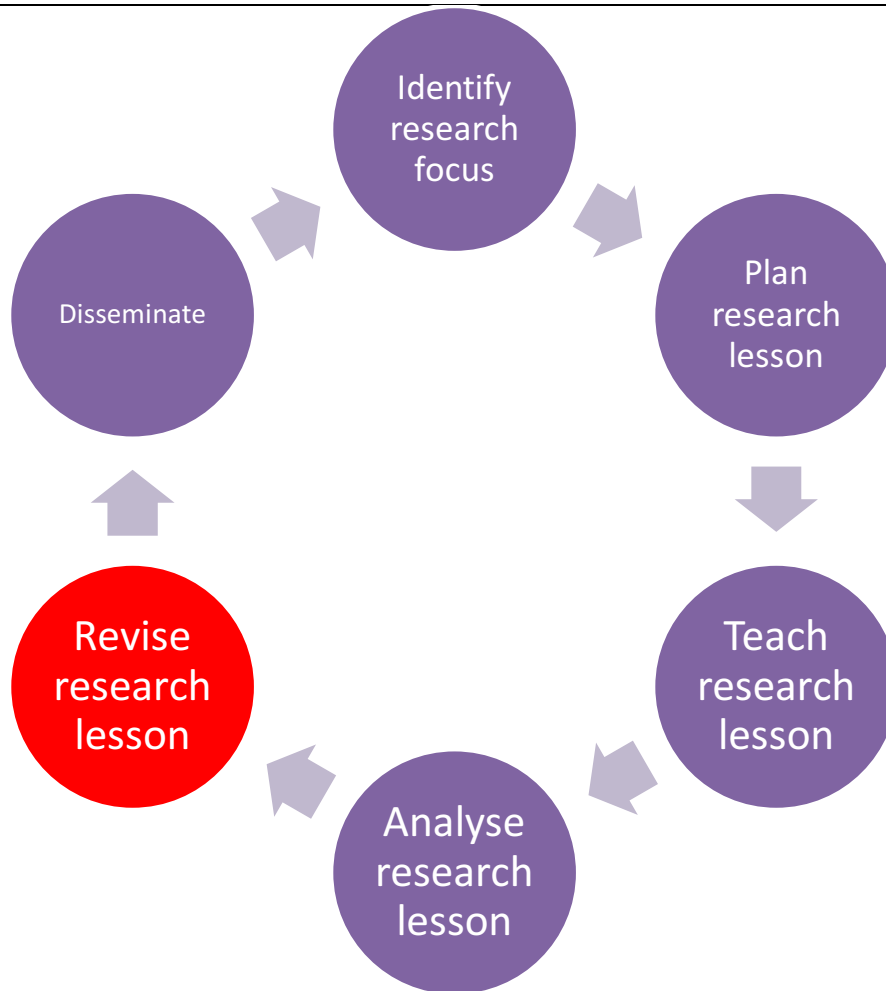
Analyse research lesson:

Same-day* (or soon after) debriefing includes a facilitator, the teacher, observers, a commentator.

1. Teacher describes the lesson and reasons behind decisions made and departures from the plan.
2. Observers describe what they saw –supported by evidence!
3. General discussion and suggestions for refining the lesson.
4. Implications for other lessons.
5. Commentator makes a significant contribution, where possible.

* If it is possible to organise

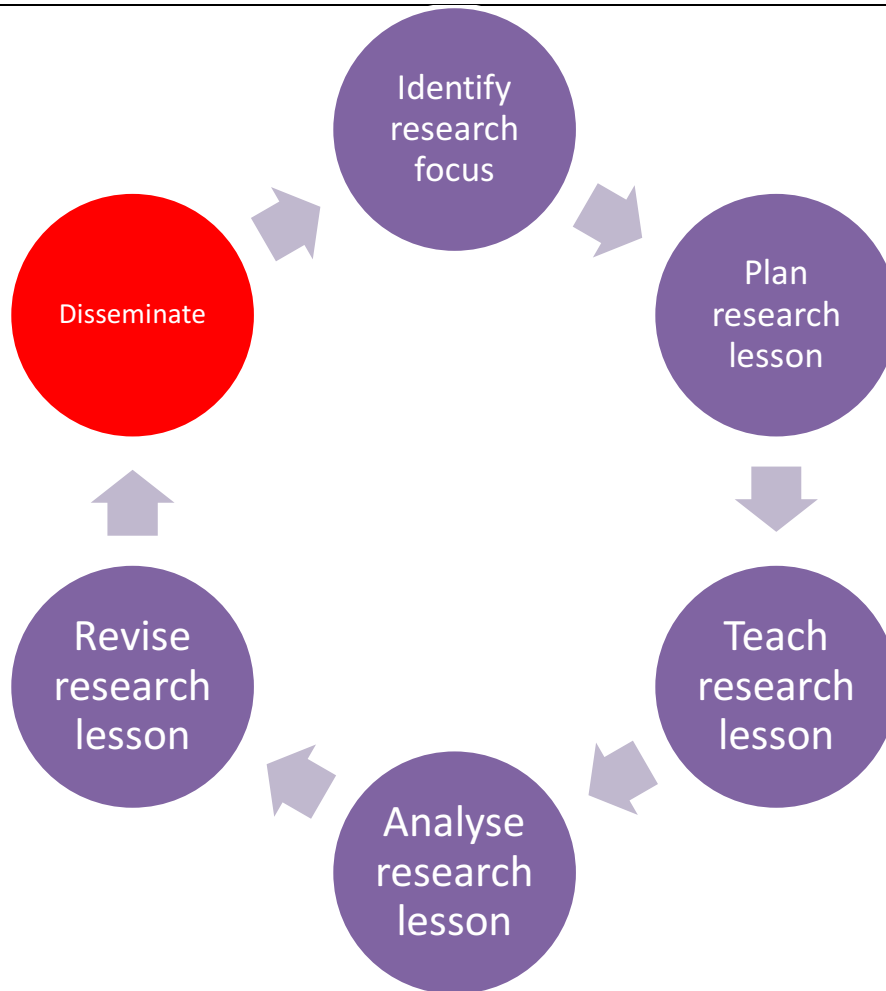
Lesson study cycle



Teachers revise the lesson plan.

- Review the lesson objectives.
- Review each phase of the lesson, the flow, the timings, the prompts.
- Revise the tasks and questions.
- Revised the anticipated pupil responses – using actual pupil responses.
- Use sample pupil work to illustrate success criteria.
- [If changes are extensive the lesson might be retaught.]

Lesson study cycle



Sharing the outcomes.

- Others review the lesson plan and also ask questions where anything is unclear.
- Teachers produce a copy of the lesson that may be disseminated among all teachers involved in the project.
- Other teachers try out the lesson and become CM Champions for their school.
- [School presents a public lesson study for others.]

Lesson study cycle

More about lesson study:

From the Teacher Development Trust

<http://tdtrust.org/what-is-lesson-study>

Lesson Study is a Japanese model of teacher-led research in which a triad of teachers work together to target an identified area for development in their students' learning. Using existing evidence, participants collaboratively research, plan, teach and observe a series of lessons, using ongoing discussion, reflection and expert input to track and refine their interventions.

From the National Centre for Excellence in Teaching Mathematics

<https://www.ncetm.org.uk/resources/18729>

A resource to support mathematics departments to use a Lesson Study approach for professional development.

From colleagues at Nottingham University

<https://www.nottingham.ac.uk/research/groups/crme/projects/lemaps/index.aspx>

The project builds on an international pilot study which explored the potential of using an adapted model of Japanese 'Lesson Study' to develop techniques for teaching mathematical problem solving. Problem solving is a topic where even high-performing nations such as Japan recognise a need for more professional learning.