

Training maths teachers with pre-made resources

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Autonomy-consistency spectrum

Each teacher in the department plans their own lessons and makes their own resources from scratch.

All teachers in the department use the same lesson resources and teach them at the same time.

Teachers generally plan their own lessons and make/find resources but also share them with each other.

The department has a centralised bank of resources, but teachers can choose whether to use them and adapt them.

All teachers in the department use the same lesson resources, but they adapt them for their classes and choose their own pacing.

Potential pitfalls with pre-made resources

I find it hard to use lesson resources that I haven't planned myself.

trainee teacher

My department all use the same resources as a basis for lesson planning. But some teachers aren't adapting them for their own classes.

Head of Maths

My trainee is using our resources but they are missing key points or skimming over important slides.

trainee's mentor

I'm not familiar enough with the resources to adapt it confidently. What if I cut something important?

teacher

A coherent view of mathematics...

“Highlights **unifying ideas** and makes **links between concepts**, so that students can experience maths not as a collection of separate topics but as a connected whole.”

“When we introduce new ideas, we need to **make connections** with earlier ideas so that students can **build on concepts** that they already understand well.”

“The key to this is **collaboration**: teachers working together to agree curriculum sequencing and approaches.”

Source: NCETM (2024) The Five Big Ideas at Secondary – Coherence

Using pre-made resources for PD

PGCE Maths Tutor:

“How could I use pre-made resources to help my trainees...”

- *learn how to plan lessons and sequences of lessons*
- *develop their own pedagogical content knowledge*

regardless of whether they use those resources in the classroom?”

Head of Maths:

“How could I help my department to...”

- *familiarise themselves with our shared bank of lesson resources*
- *unpick the rationale behind how they are made and identify key points*
- *feel more confident with adapting them for their own classes?”*

Session contents

1. Sequencing lessons within a topic unit
2. Sequencing slides within a lesson resource
3. Adapting lesson resources with fidelity



Sequencing lessons within a topic unit

Setting the scene

Scenario 1

PGCE Maths Tutor:

“I want my trainee teachers to learn how to sequence lessons for a topic, while also developing their pedagogical content knowledge about compass and ruler constructions.”

Scenario 2

Head of Maths:

“Our department are using a fully resourced scheme of work. I want to help teachers in my team to understand how the lessons in the ‘Constructions’ unit are ordered, and why.”

Group task: sequencing lessons

- **Source:** Oak National Academy
- **Year group:** 8
- **Unit:** Constructions
- **Number of lessons:** 10

Look at the 10 handout sheets.

Each sheet contains the title of a lesson and its key learning points.

Work together to arrange the lessons into a logical order.

Have a clear rationale for the reasoning behind your chosen order.

Reflect on the previous task

- Which decisions had the greatest consensus among the group?
- Why was this the case?
- Which decisions caused the greatest amount of debate?
- Why was this the case?

The sequence of lessons on Oak

1. Checking compass skills
2. Securing the skill of using a pair of compasses
3. Understanding constructing a circle
4. Constructing triangles
5. Constructing rhombi
6. Diagonals of a rhombus
7. Bisecting an angle
8. Perpendicular bisector of a line segment
9. Perpendicular to a given line through a given point
10. Problem solving with constructions

Did anything **surprise** you?
Why do you think they are
sequenced this way?



Sequencing slides within a lesson resource

Setting the scene

Scenario 1

PGCE Maths Tutor:

“I want my trainee teachers to learn how to sequence content within a lesson, chunk it into small steps and check for understanding regularly.

We’ll do this by exploring a pre-made lesson about Pythagoras’ Theorem.”

Scenario 2

Head of Maths:

“I’ve picked out a slide deck, from our centralised resources, for the first lesson about Pythagoras’ Theorem.

I want to help the teachers in my team to understand the rationale behind how its slides and activities are sequenced.”

Group task: sequencing lessons

- **Source:** Oak National Academy
- **Year group:** 9
- **Unit:** Geometrical properties: similarity and Pythagoras' theorem
- **Lesson:** Demonstrating Pythagoras' theorem

The handout contains slides from this resource in a shuffled order.

The slides are reformatted versions of the teacher-input slides (explanations and checks for understanding)

Work together to arrange the lessons into a logical order.

Have a clear rationale for the reasoning behind your chosen order.

Reflect on the previous task

- What did this task prompt you to think about?
- What key decisions did you need to consider?
- Which decisions had the greatest consensus among the group?
- Which caused the greatest amount of debate?
- Why was this the case?



Adapting lesson resources with fidelity

Setting the scene

Scenario 1

PGCE School Mentor:

“My trainee is using our school’s pre-made resources. But they are spending pretty much an equal amount of time on every slide, meaning they are skimming over the most crucial parts.

I’d like them to think about which parts of the resource are the most important for our class to meet aims of the lesson, and where to linger longer.”

Scenario 2

Head of Maths:

“Our department uses a centralised bank of resources. I encourage my team to adapt each slide deck for their own classes. But they are worried about skipping slides that are important, so feel tentative about adapting them.

I’ve selected a particular slide deck and would like them to collectively identify which parts are useful to prioritise.”

Group task: if you could use just 3 slides...

- **Source:** Oak National Academy
- **Year group:** 9
- **Unit:** Geometrical properties: similarity and Pythagoras' theorem
- **Lesson:** Demonstrating Pythagoras' theorem

Look at the slides from the previous task.

If you were only allowed use three slides, which ones would you choose?

Explain the reasons for your choice of slides.

Alternative PD task: use, do or bin

Teachers take a slide deck and sort its slides into three categories (e.g. by arranging printouts, labelling slides with badges, etc).

I would use this slide
(or an edited version).

I would use the same
idea or content, but
without the slide
(e.g. writing on a
whiteboard)

I wouldn't use this
slide or its content.

Reflect on the previous task

- What did this task prompt you to think about?
- Where there any slides that you all agreed on?
- Why do you think that was?
- Did any slides cause a debate?
- Why do you think that was?
- Would any extra information be useful for this task?

Summary

1. Sequencing lessons within a topic unit
2. Sequencing slides within a lesson resource
3. Adapting lesson resources with fidelity