Primary mathematics

ITE dissemination conference

5 November 2013

Supplementary information

Information provided:

- The discussion points and activities
- Links to key documents

Links to key documents:

- *Mathematics: made to measure* (110159), Ofsted, May 2012; www.ofsted.gov.uk/resources/110159

- *Mathematics: understanding the score* (070063), Ofsted, Sept 2008; www.ofsted.gov.uk/resources/070063

- *Good practice in primary mathematics: evidence from 20 successful schools* (110140), Ofsted, Nov 2011; www.ofsted.gov.uk/resources/110140

- Mathematics subject grade criteria (revised criteria due soon) www.ofsted.gov.uk/resources/20100015

- Ofsted's mathematics web page www.ofsted.gov.uk/inspection-reports/our-expert-knowledge/mathematics

- NC programmes of study, DfE, 2013; https://www.gov.uk/government/publications/national-curriculum-in-england-mathematics-programmes-of-study

- Teachers' Standards, DfE, 2011; www.education.gov.uk/schools/teachingandlearning/reviewofstandards/a00205581/teachers-standards1-sep-2012

Discussion point 1

Why is the effectiveness of partnerships' work in primary mathematics weaker than the overall effectiveness?

Discussion point 2

Reflecting on your trainees' development as teachers of mathematics, what areas of:

- growth in confidence
- anxiety

do they show?

What are you doing to overcome the anxieties?

Discussion point 3

- Why do trainees cater least well for high attainers?
- What are you doing to help them with this?

Activity 1: lesson planning – the formula for area of a rectangle

Look at the following extracts from a trainee's Year 5 lesson plan.

What do they suggest about:

a) the teaching approach

b) the trainee's subject knowledge?

The trainee's notes for the main part of the lesson included:

We calculate the area of rectangles using a formula Length x breadth (width). Ask a child to identify the length and the width of the shape. If the length is 5m and the width is 4m then your number sentence will be 5 x 4. Explain to children that the answer must be squared. M2

The trainee had prepared a large number of floor plans for pupils to work on. The tasks were differentiated thus:

SEN - rooms (rectangles) by counting squares
LA - rooms (regular & irregular) by counting squares/part squares
MA - regular & irregular by counting squares/part squares; then use formula for rectangles
HA - use formula L x W for regular real-life shapes
GT - use formula L x W for regular & irregular real-life shapes.

Activity 2: lesson planning – challenging reasoning about area and developing problem solving

Look at the following extracts from a NQT's Year 6 (set 1) lesson plan.

What do they suggest about:

a) the teaching approach

b) the trainee's subject knowledge?

The teacher's notes for the main part of the lesson included:

Explain how to find the area of a rectangle, formula length x height = area.
Work through examples on IWB.
Then show football pitch and pose question: the area is 1800m² and the length is 60m, so the width must be? Ask chn how they worked it out. Using the inverse.
Chn to work through mix of questions.
Then explain how to find area of triangle. Formula area = (base x height) ÷ 2.

Her notes for the plenary were:

work through SATs questions involving finding the area of a rectangle or triangle.

Activity 3: using and applying mathematics

Look at the following case study (paragraph 108 of *Mathematics: made to measure*)

With a partner, discuss how the NQT might be supported to improve:
- the lesson planning
- the learning and outcomes.

Weaker factor: a need for guidance on using and applying mathematics

The newly qualified Year 5/6 teacher set the pupils the 'pond borders' investigation. The learning objective was 'to be able to apply addition to solve mathematical problems'.

Two groups were working on square ponds, and one group on rectangular ponds of dimension n+1 by n. Well into the lesson, pupils were working in pairs, making the pond borders from tiles and predicting what the number of tiles for the next pond would be. 'It is going up in the four times table' was one pupil's comment.
The group working on the rectangular pond was being supported by a teaching assistant who was steering them too strongly towards sums of the form L + L + W + W + 4 for particular ponds. One boy, working independently from his peers in the group, justified his solution for a 10 x 11 pond by jotting on his mini-whiteboard:

1	10	1
11		11
1	10	1

He then wrote 10+10+10+10+1 +1+1+1+1+1 = 46.

Additional information from the teacher's lesson plan:

- The lower attaining groups would work on square ponds, making the ponds and borders with multi-link cubes and recording their answers until they spot a pattern. The plan for this group contained the question 'can the children predict the next numbers?' (No other questions were provided in the plan.)
- The middle attainers, working on 3x4, 4x5, … ponds, were expected to identify the pattern more quickly but could use drawing or cubes to 'reinforce' this.
- The high attainers were given a different task (a doubling pattern based on growing branches of mistletoe).

Discussion point 4

Where are you on this continuum?

- Does your work to audit and develop trainees' subject knowledge include their conceptual understanding too?

- In the light of the new National Curriculum, what are you doing differently this year to develop trainees' subject knowledge?

Activity 4: progression in subtraction

In the plastic wallet are the elements of the subtraction section of a school's calculation policy.

It is not presented as exemplary, but has strengths.

In groups of two or three:
- put the elements in the order they could be taught
- identify strong features of the policy.

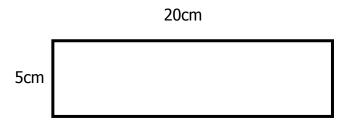## Discussion point 5

How do you:
- ensure that all mentors provide good quality training and support for trainees?
- develop or refresh mentors' subject expertise?

What about the tutors …

… and the course leaders?

Activity 5: deepening problem solving

What is the area of this rectangle?

20cm

5cm

Adapt this question to encourage pupils to think harder about how to solve it, and better develop problem solving and conceptual understanding of area of rectangle.

(The problem you devise should be based on the same 20cm by 5cm rectangle.)

Activity 6: lesson observation and feedback

Look at the lesson-observation and feedback records you brought with you, and think about how lesson observation and feedback are used in your partnership.

- Do they get to the heart of the matter?
- Do the records:
  - identify the most important subject-specific aspects
  - promote improvement in trainees' teaching of mathematics?

Discussion point 6

Can you improve the effectiveness and consistency in quality of lesson observation and feedback in your partnership?

How might you go about it?

Discussion point 7

What are the implications for ITE of the new National Curriculum?

Discussion point 8

What is your top priority?
- what strengths can you build on?
- what barriers must you overcome?