# Designing Professional Development

# Handouts

### Contents

**Handout 1:** Aspects of practice that could be a focus for PD 2

**Handout 2:** Where are teachers starting from? **……………………………………………………….………..……**.4

**Handout 3:** Sample professional development workshops……..……………………….………………….….…. 5

**Handout 4: H**elping teachers to report back on experiences …...6

**Handout 5:** Reflecting on the models ..7

### Copying

*Except where noted/credited otherwise, these materials are Copyright © 2015-2017 Mathematics Assessment Resource Service, University of Nottingham. They are published under the* [*Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International*](https://creativecommons.org/licenses/by-nc-sa/4.0/) *license, so they may be copied and adapted for non-commercial use under certain conditions and with appropriate attribution. Please see the license for details, or contact us via* [*http://mathnic.mathshell.org/contact.html*](http://mathnic.mathshell.org/contact.html) *if in doubt.*

*All MathNIC materials can be freely downloaded from our website* [*http://mathnic.mathshell.org/*](http://mathnic.mathshell.org/)

## **Handout 1:** Aspects of practice that could be a focus for PD

Organize the statements into two sets, according to whether you think that they are important or not a priority for PD right now.

Select two topics of highest priority, and be prepared to justify why these are highest priority to the whole group.

|  |  |
| --- | --- |
| How to lead whole-class discussions. | Eliciting and interpreting students’ reasoning. |
| Understanding and using formative assessment. | Learning how to teach a difficult concept. |
| Assessing student progress. | Building respectful relationships with students. |
| Specifying and reinforcing productive student behavior. | Asking questions that promote students’ reasoning |
| Setting up and managing collaborative discussions. | Using students’ cultural, and personal backgrounds as resources for instruction. |

|  |  |
| --- | --- |
| Adapting lessons to students’ individual learning needs. | Developing norms and routines for classroom discourse and work. |
| Setting long- and short-term learning goals for students. | Designing single lessons and sequences of lessons. |
| Learning how to teach mathematical modeling. | Designing effective mathematical tasks for students |
| Learning about the progression of a topic in a commonly used textbook. | Working with parents. |
| Current changes in the curriculum. | Understanding how math is used in the world around us. |
|  |  |

## **Handout 2:** Where are teachers starting from?


## **Handout 3:** Sample professional development workshops

This outline consists of a series of meetings using the Mathematics Assessment Project PD modules from the website http://map.mathshell.org/pd

|  |  |  |
| --- | --- | --- |
| **Meeting 1: Formative Assessment** | *Key question:* | **How can I respond to students in ways that improve their learning?** |
| *Activities:* | * Introducing formative assessment
* Teachers’ own experiences of formative assessment
* Principles for formative assessment
* Analyze students’ responses to problem-solving tasks
* Observe formative assessment in action
* Plan a formative assessment lesson together
* Consider the effects of feedback on student learning
 |
| *Challenge*  | Use one of the lesson plans and report back on what happens next time. |
| **Meeting 2:****Concept Development**  | *Key question:* | **How can I help students develop a deeper understanding of Mathematics?** |
| *Activities:* | 1. Reporting back on the lessons taught
2. Using assessment tasks
3. What causes mistakes and misconceptions?
4. The Formative Assessment Lesson
5. Working on four different task types: Classifying mathematical objects; Interpreting multiple representations; Evaluating mathematical statements; Exploring the structure of situations
6. Plan a lesson together
 |
| *Challenge*  | Teach the lesson you have planned and report back next time on the outcomes |
| **Meeting 3:****Problem Solving** | *Key question:* | **Do I stand back and watch, or intervene and tell them what to do?** |
| *Activities:* | 1. Reporting back on the lessons taught
2. Revising structured problems
3. Compare structured and unstructured problems
4. Consider strategies for offering help
5. Observe and analyze a lesson (video)
6. Plan a lesson together
 |
| *Challenge*  | Teach the lesson you have planned and report back next time on the outcomes |
| **Meeting 4:****Improving learning through questioning** | *Key question:* | **How can we ask questions that improve thinking and reasoning?** |
| *Activities:* | 1. Reporting back on the lessons taught
2. Reflect on the questions we ask
3. What types of questions develop thinking and reasoning?
4. Observe and analyze a lesson (video)
5. Plan a lesson together
6. Solve a problem, "thinking aloud"
 |
| *Challenge*  | Teach the lesson you have planned and report back next time on the outcomes |
| **Meeting 5****Students working collaboratively** | *Key question:* | **How can students learn from discussing mathematics?**  |
| *Activities:* | 1. Reporting back on the lessons taught
2. Experiencing a discussion (in groups)
3. Analyzing a discussion (role play from transcripts)
4. Recognizing the concerns of teachers
5. Creating & Establishing "Ground Rules" with students
6. Managing collaborative discussion
7. Observe and analyze a discussion lesson (video)
8. Plan a lesson together
 |
| *Challenge*  | Teach the lesson you have planned and report back next time on the outcomes |
| **Meeting 6****Reflecting on our learning** | *Key questions:* | **What have we learned? How can we share this with colleagues?** |
| *Activities* | 1. Reporting back on the lessons taught
2. Sharing what participants have learned
3. Embedding our learning in our future practice
4. Planning to share our learning with colleagues
 |
| *Challenge* | Use the materials we have shared with you to run a session with your colleagues back at school.  |

## **Handout 4:** Helping teachers to report back on experiences

This prompt sheet has been used to help interview teachers as part of their reporting back.

### What were your fears and expectations about the lesson?

### How did you prepare for the lesson?

* Did you assess students before the lesson?
* How did students’ prior knowledge affect your planning?

### How did you organize the lesson?

* Did you use your preliminary assessment to inform your organization?
* Did you change the seating, for example?

### How did you introduce the lesson?

* Did you share your learning intentions and criteria for success?
* Did you provide feedback on any preliminary assessment?
What for did this take? Questions? Advice? Scores?
* What did you tell the students about:
The way they should work on the activity?
The reasons why you wanted them to work in this way?

### What happened during small group work?

* What did students find difficult to understand?
* What did you find difficult?
* How and when did you intervene?
* What were the best questions you asked?
* Were students helping one another?
* Was there any evidence of peer assessment?

### What happened during whole class discussions?

* How did you organize it? Just at the end, or during the lesson?
* How did you select student work to discuss?
* Were students able to discuss the reasoning of others?
* What did you draw attention to?

### What did you learn from this experience?

* What would you do differently next time?
* Have your experiences affected your attitudes towards teaching and learning?
* Do you feel you are changing in your attitudes towards assessment, student errors, classroom talk?

### What general issues have arisen for you?

* What general issues do you wish to raise with the whole group?

## **Handout 5:** Reflecting on the models

Which of the **characteristics of effective PD** listed below does each of these models incorporate? Complete the table, identifying the strengths and weaknesses of each model.

* **Experiential** – stimulating and drawing on teachers’ own experiences as reflective practitioners.
* **Sustained** – involving cycles of planning, predicting, enacting, and reflecting.
* **Collaborative –** involving networks of teachers and administrators.
* **Informed –** by outside expertise and research.
* **Focused –** attentive to the development of the mathematics itself.

*(Guskey, 2002; Joubert and Sutherland, 2009; Villegas-Reimers, 2003; and many others…)*

|  |  |  |  |
| --- | --- | --- | --- |
|  | Effective PD characteristics | Strengths | Weaknesses |
| TrainingTransmission of information by an expert. |  |  |  |
| CoachingCoach and teacher working together one on one. |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Effective PD characteristics | Strengths | Weaknesses |
| Workshop courseCourses mediated by a provider, that offer teachers opportunities to explore ideas in their own classrooms and report back. |  |  |  |
| Professional learning communitiesTeachers take over responsibility for setting their own research goals and collaboratively and systematically study them in their own classrooms.  |  |  |  |

|  |
| --- |
| How might these models be combined and organized in your schools?What immediate questions does this raise for you?  |