PRE-TERM 2 TRAINING
IN-SERVICE TEACHER TRAINING
PROGRAMME AND CURRICULUM REVISIONS
IN MATHEMATICS

For Math Coaches and Teachers

Ada District: January 9-12, 2017
Ga West District: January 10-13, 2017
Foreword

Welcome! In 2014, the Ministry of Education established a national committee to examine the state of mathematics and science teaching and learning and develop recommendations to ensure that future learners develop the mathematics understandings and skills required to meet the needs of an increasingly technological society. The Commission’s report, Reforming Science and Mathematics Education in Basic Schools in Ghana, included a national road map to improve the state of mathematics teaching and learning.

Based on this roadmap and the Commission’s recommendations, a review of the early grade curriculum in mathematics has been conducted, new syllabi have been produced, and an in-service training program for teachers has taken shape.

This document outlines the plan for the Pre-Term 2 Training for coaches and teachers. It provides an opportunity for coaches and teachers to enhance their skills and knowledge related to in-service training priorities, with a particular focus on how to use the updated schemes of work.

Goals

The Pre-Term 2 Training is designed:

- To provide math coaches with the knowledge, skills and attitudes necessary to carry out their role as facilitators of in-service training activities related to the Numeracy Pilot as well as to support the implementation of curriculum revisions.
- To provide teachers with the knowledge, skills and attitudes necessary to implement curriculum revisions and enhance the learning of mathematics in the classroom.
- To provide math coaches and teachers with an opportunity to share their experiences in implementing the Numeracy Pilot.

Learning Outcomes

At the end of the training, math coaches will be able to:

- Describe the purpose and approach of key activities in the upcoming units of the in-service training programme.
- Explain how to use several TLMs to enhance numeracy instruction.

At the end of the training, teachers will be able to:

- Design a lesson plan and an assessment using the weekly scheme of work
- Explain how to use several TLMs to enhance numeracy instruction.
- Demonstrate grade appropriate activities for new learning
- Describe strategies for working in pairs
- Identify key terms to enhance teaching in local language
## Schedule

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<td><strong>Welcome!</strong></td>
<td><strong>Session 8: Numeracy Teaching Challenge</strong></td>
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<td><strong>Overview</strong></td>
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<td><em>Teachers rotate through 8 kiosks with 8 challenges related to the use of manipulatives and problem solving.</em></td>
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<tr>
<td><strong>Session 1: How is it going?</strong></td>
<td><strong>Session 5: How is it going?</strong></td>
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<tr>
<td><em>Summary of Survey</em></td>
<td><em>Discussion on revised syllabus</em></td>
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<tr>
<td><em>Highlights of Experiences So Far, Struggles</em></td>
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<td><strong>Break</strong></td>
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<tr>
<td><strong>Session 2: Coaching Materials</strong></td>
<td><strong>Session 6: Teacher Resource Package for Terms 2</strong></td>
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<tr>
<td><em>Review 1-5</em></td>
<td><em>Introduce key content and ideas 6-11</em></td>
<td><em>Sharing vocabulary</em></td>
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<tr>
<td><em>Updated model for session</em></td>
<td><em>Introduce revisions to the Teacher Resource Package.</em></td>
<td><em>Practise leading activities in local language</em></td>
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<td><em>Time management</em></td>
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<td><em>Incorporating local language</em></td>
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<td><strong>LUNCH</strong></td>
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<td><strong>Session 3: Coaching Skills</strong></td>
<td><strong>Session 7: Lesson Planning Activity</strong></td>
<td><strong>Session 10: Classroom Management</strong></td>
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<tr>
<td><em>Time management</em></td>
<td><em>Work through planning a week of lessons using the new format in small groups</em></td>
<td><em>Tips for organising pairs work</em></td>
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<tr>
<td><strong>Break</strong></td>
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<tr>
<td><strong>Session 4: Weekly Scheme of Work</strong></td>
<td><strong>Continued</strong></td>
<td><strong>Session 11: Looking Ahead</strong></td>
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<tr>
<td><em>How to lead the lesson planning section of the Coaching Session</em></td>
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<td><em>Evaluation</em></td>
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<td><strong>Session 6</strong></td>
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## Agenda

**MATH COACHES’ TRAINING**

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<thead>
<tr>
<th>Day 1</th>
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<tbody>
<tr>
<td>Welcome!</td>
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<tr>
<td>Introductions</td>
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<tr>
<td>Overview of Training</td>
</tr>
<tr>
<td>30min</td>
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<tr>
<td><strong>Session 1: How is it going?</strong></td>
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<tr>
<td>Summary of Survey</td>
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<tr>
<td>Share Experiences</td>
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<tr>
<td>Highlights of Experiences So Far, Challenges</td>
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<tr>
<td>1 hr 15 min</td>
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<tr>
<td><strong>Break</strong></td>
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<tr>
<td><strong>Session 2: Coaching Materials</strong></td>
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<tr>
<td>Brief Review of Term 1 materials</td>
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<tr>
<td>Updated model of Coaching Session</td>
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<tr>
<td>Content of Coaching Sessions 6 - 11</td>
</tr>
<tr>
<td>1.5 hours</td>
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<tr>
<td><strong>LUNCH</strong></td>
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<tr>
<td><strong>Session 3: Coaching Skills</strong></td>
</tr>
<tr>
<td>Focus on time management, local language</td>
</tr>
<tr>
<td>1.5 hours</td>
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<tr>
<td><strong>Break</strong></td>
</tr>
<tr>
<td><strong>Session 4: Scheme of Work</strong></td>
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<tr>
<td>Lesson planning during Coaching Session</td>
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<tr>
<td>1 hour</td>
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Welcome, Introductions, Overview

Welcome (10 min)

Introductions (10 min)
- Ask each coach to introduce him or herself
- Each person should say their name, their schools and say one thing they hope will come out of the training.
- Facilitator should note the expectations and relate them to the schedule if possible.
- *If the participant’s expectation is completely beyond the scope of the training, try to find a way to address the expectation in another way at another time*

Overview of the Forum (15 min)
- Goals of training (PPT)
- Schedule (handout)
- Learning outcomes for the training (PPT)
- Housekeeping:
  - Bathrooms, meals, lodging, transportations notes?
  - Be present - Phones on silent; Calls taken outside
- Forum environment – we need to promote an environment where people feel comfortable to share ideas and to ask questions, goal of helping one another understand, support one another to become better coaches. We are a team.
Session 1: How Is It Going?

PPT

**Survey Results** (15 min)
- Thank coaches for participating in the WhatsApp survey.
- Present a summary of the survey results.

Post-Its (2 Colours)

**Share Experiences** (20 min)
- Invite participants to discuss in pairs
- Each member of the group should:
  - **What was the best moment of coaching in Term 1? Why?**
    - *NOTE: summarise the best moment in a few words on a post-it that can be put on the wall.*
  - **What was your biggest struggle or challenge in Term 1? Why?** (If it has been resolved, how did you resolve it?)
    - *NOTE: summarise the greatest challenge in a few words on a post-it that can be put on the wall*
- Be ready to share best moments and challenges with the whole group.

Group discussion on highlights and struggles (30 min.)
- Invite participants to present their best moments and biggest struggles so far. *They should put their different coloured post-its on the wall.*
- Facilitator should take a picture of these and list of best moments and a list of challenges
- When challenges are unresolved, facilitators should note these
- For the list of challenges,
  - **Ask:** Has anyone experienced similar challenges? How have you tried to address these challenges? Do we have some ideas? How can we support this coach?
# Session 2: Coaching Materials Review

<table>
<thead>
<tr>
<th>Materials Review (20 min)</th>
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<tbody>
<tr>
<td>• Invite coaches to share their thoughts about the Coaching Session materials provided.</td>
</tr>
<tr>
<td>• You are the experts because you have used these materials. We will gather your comments to make improvements to the materials for next year’s coaches</td>
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<tr>
<td>o Did you encounter any errors in the Coaching materials?</td>
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<tr>
<td>o Were there any activities that you did not understand?</td>
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<tr>
<td>o What improvements could you suggest to make the materials easier and clearer?</td>
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<table>
<thead>
<tr>
<th>Coaching Sessions and Learning Circles 6 - 11 (1 hour)</th>
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<tbody>
<tr>
<td>• Pass out the new versions of 6 - 11</td>
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<tr>
<td>• Present the changes to the coaching session model</td>
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<tr>
<td>1. Mental Math 2 has been removed (optional at the end)</td>
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<tr>
<td>2. The Scheme of Work activity is more structured (Session 4)</td>
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<tr>
<td>• Present the key activities and ideas for each Coaching Session</td>
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<tr>
<td>• Ask coaches to participate by reading aloud or leading activities where indicated</td>
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</table>
Session 3: Coaching Skills

At the Coaching Forum, coaches indicated that they would like to improve their coaching skills in several areas. In this workshop, we will focus on two areas:

1. Time Management
2. Using local language

Time Management (30 min)
- Present some key ideas for improving time management skills using the Powerpoint.
- Ask coaches to participate where indicated.

Key Vocabulary in 6 – 11 (20 min)
- Divide the group into pairs (3 groups).
- Ask each group to be responsible for 2 Coaching Sessions (6,7; 8,9; 10,11)
- Ask each pair to identify the key concepts and vocabulary in the session, and to determine an adequate translation for the term in local language. These words are often bolded, but not always. For example:
  - Pattern recognition
  - Mathematical communication

Share Key Vocabulary (40min)
- Invite each pair to share the vocabulary they have identified.
- A secretary should record terms and share among coaches.
- This will be a makeshift glossary.

- There may be differences of opinion on terms. Tell coaches that a glossary of terms is being developed but that there is no definitive glossary yet. For now, they should use the terms that they find useful.
Session 4: Scheme of Work

Introduce Scheme of Work Activity (15min)
- Ask coaches to turn to a scheme of work segment in one of the coaching sessions.
- Review the organization of a Weekly Scheme of Work using the Scheme of Work for Term 2 Week 2 in P2,
- Review the lesson planning tool

Practice lesson planning (30 min) BE STRICT WITH TIME!!!
In groups of 3 (2 groups)
- Use Scheme of Work for P2, Week 2 to plan lessons for the week.

Group discussion (15 min)
- How far did you get with your planning?
- Were you able to complete the lesson plan?
- What strategies can you use to facilitate this activity in the 20 minutes allocated during the Coaching Session? (you had 30min)

Some suggestions:
- Get into groups quickly.
- Establish regular partners
- Use bookmarks or page markers for the scheme of work documentation
- Ensure that teachers have a blank lesson plan prepared.

- If you know that teachers will be unable to complete a full lesson plan, focus their work on activities that will benefit from discussion – like new learning activities
- Again if time is an issue, vary the aspect of the scheme of work that you prioritise. For example, one week focus on the new learning activity, the next week ensure that everyone completes the assessment, the next week mental math, etc.
- Reassure the teachers that as they gain experience with lesson planning, it will become easier.
End of Day

End of Day Check-in (10 min)

- How did the day go for you?
- What could be improved?

Information regarding Day 2 of the training:

- Teachers will be joining group
- Sometimes you will be called on to help with the training
  - Guide teachers
  - Stimulate discussion in small groups
  - Lead activities
  - Create positive, encouraging learning environment

- On Day 2, specifically, you will be asked to do the following:
  - Session 5:
    - Help teachers summarise their best moments and challenges on post-it notes.
    - Help facilitators group post-its with common themes
    - Help takes notes if needed
  - Session 7:
    - Go around during pairs work in order to provide guidance during the lesson planning activity
Agenda

**Day 2**

**Welcome!**
*Introductions*
*Overview of Training*
45min

**Session 1: How is it going?**
*Share Experiences*
*Highlights of Experiences So Far, Challenges*
1 hour

**Break**

**Session 6: Teacher Resource Package – Term 2**
*Presentation of new format including weekly schemes of work, lesson plan design, guidelines for Learning Circle and assessment tools*
1.5 hours

**Lunch**

**Session 7: Lesson Planning**
*Plan lessons for a week using tools*
2 hours 15 min

**Break**
*Continued*
# Welcome, Introductions, Overview

## Welcome (10 min)

## Introductions (20 min)
- Ask the participants to assemble by school group. Coaches should be part of both groups.
- Ask the participants to introduce themselves by school, to say what grade they teach and to name one part of the Coaching Sessions that they like and why.

## Overview of the Forum (15 min)
- Goals of training (PPT)
- Schedule (handout)
- Learning outcomes for the training (PPT)
- Housekeeping:
  - Bathrooms, meals, lodging, transportations notes?
  - Be present - Phones on silent; Calls taken outside
- Forum environment – we need to promote an environment where people feel comfortable to share ideas and to ask questions, goal of helping one another understand, support one another to become better coaches. We are a team.
Session 5: How Is It Going?

Share Experiences (30 min)

- Invite participants to discuss in groups of 3-4 teachers. Groups should be according to grade level.
- Each member of the group should say:
  - What was the best moment of teaching math in Term 1? Why?
  - NOTE: Coaches and facilitators should help teachers summarise the best moment in a few words on a post-it that can be put on the wall.
  - What was your biggest struggle or challenge in teaching math in Term 1? Why?
  - NOTE: Coaches and facilitators should help teachers summarise the greatest challenge in a few words on a post-it that can be put on the wall

- Be ready to share 3 best moments and 3 challenges with the whole group (1 each). Any remaining post-its can be placed on the wall for others to view later.

Group discussion on highlights and struggles (30 min.)

- By group, invite participants to put their post-its with best moments and biggest struggles on the wall.
- Each group should share 3 best moments and 3 challenges. (1 of each per person)
- A coach can help to group similar best moments and challenges.
- Facilitator should take a picture of the wall and a secretary should list of best moments and a list of challenges

In closing the discussion,

- Facilitator should summarise some of the items that occur frequently.
- If the challenges will be addressed during the training, the facilitator should note this.
### Session 6: Teacher Resource Package – Term 2

**Teacher Resource Package for Term 2 (1.5 hours)**

- Present the new format for the **scheme of work**
  - Orientation questions for teachers
- Present the new format for the **lesson plan**
  - Orientation questions for teachers
- Present the new **guidelines** for working with the scheme of work in the learning circle
  - Orientation questions for teachers
- Present the **assessment tool and assessment record**
  - Orientation questions for teachers

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### Session 7: Lesson Planning

#### Lesson Planning (1 hour)
- Ask participants to work in pairs with someone who teaches **the same grade level (but from a different school)**
- Using the guidelines from the Learning Circle, each pair should develop lessons for a week according to the weekly scheme of work.
- **Facilitators and coaches should go round from group to group to assist them in their planning.**

#### Presentations (1 hour)
- Ask 2 pairs from each grade level to present their lesson plan (ie. 2 pairs from P1 and 2 pairs from P2 for a total of 4 presentations)
- Ask others from same grade level to say how their plans are different.
- Provide guidance if there seems to be confusion about lesson planning

#### Discussion (15 min)
- How did you find this lesson planning activity?
- What are the important things to keep in mind when lesson planning using the scheme of work?
- Note the teachers’ observations.
End of Day

End of Day Check-in (10 min)
- How did the day go for you?
- What could be improved?

Ask Coaches to stay for a briefing on Day 3 of the training:
- Review the responsibilities of the coaches Sometimes you will be called on to help with the training
  - Guide teachers
  - Stimulate discussion in small groups
  - Lead activities with TLMs
  - Create positive, encouraging learning environment

- On Day 3, specifically, you will be asked to do the following:
  - Session 8:
    - Run demonstrations at one of 8 kiosks as part of the Numeracy Teaching Challenge
  - Session 9:
    - Share local language vocabulary from Day 1
    - Guide teachers in developing variation of new learning activities for Week 1 of Term 2
Agenda

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<thead>
<tr>
<th>Session 8: Numeracy Teaching Challenge</th>
<th>1.5 hours</th>
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<tbody>
<tr>
<td>Teachers rotate through 8 kiosks with 8 challenges related to the use of manipulatives, mental math and new learning activities.</td>
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<tr>
<th>Break</th>
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<tr>
<th>Session 9: Local Language</th>
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<tr>
<td>Sharing vocabulary</td>
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<tr>
<td>Practise leading activities in local language</td>
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<th>Lunch</th>
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<tr>
<th>Session 10: Classroom Management</th>
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<tr>
<td>Tips for organising pairs work</td>
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<th>Break</th>
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<tr>
<th>Session 11: Looking Ahead</th>
<th>40 min</th>
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<tr>
<td>Upcoming activities and support</td>
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<th>Evaluation</th>
<th>25 min</th>
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Session 8: Numeracy Teaching Challenge

**Numeracy Teaching Challenge (1.5 - 2 hours)**

- The room or rooms will need to be organized into 8 different stations.
- Each station should be numbered.
- Teachers will be given a Numeracy Teaching Challenge Card on which the 8 challenges are listed.
- The goal is to complete all the 8 challenges.
- Teachers will go round in groups of 2 or 3 with, ideally with the same grade level. They should form 8 groups total (4 groups of 2 and 4 groups of 3)
- One facilitator is the **time keeper**. Every 10 minutes the teachers must change stations. (Facilitator will need a bell or an alarm).

**Roles of Coaches and Facilitators**

- A coach or a facilitator should lead the activity at each station.
- They should lead the activity.
- They should check off the teacher’s card once the activity has been completed.
- Teachers can collaborate within their group, but all should participate.
- They should guide the teachers when needed.
- They should challenge the teachers to use local language.

**Role of Teachers**

- Try to complete all 8 activities and check off all 8 activities on their card.
- Teachers can collaborate within their group, but all should participate.
- Teachers should move from one station to the next in a timely manner.
<table>
<thead>
<tr>
<th>Station 1</th>
<th>Challenge:</th>
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<tbody>
<tr>
<td>Show 25 + 7 using bundles and straws on an addition mat or frame.</td>
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<tr>
<td>Teachers should make the addition mat or frame on a blank piece of paper. Use local language.</td>
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<thead>
<tr>
<th>Station 2</th>
<th>Challenge:</th>
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<tr>
<td>When asked to add 24 + 15, Jacob tries to do the question in his head (mentally) by doing friendly jumps. He starts off like this: 20 + 10 + .... but he forgets how to continue! How would you help him finish solving the problem in this way?</td>
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<tr>
<th>Station 3</th>
<th>Challenge:</th>
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<tbody>
<tr>
<td>Joyce has bought 4 onions at the market, but she needs 12 to have enough for the stew. How many more does she need to buy?</td>
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<tr>
<td>Teachers should identify what type of question this is (see Table in Teacher Resource Guide outlining different types of addition and subtraction problems) and show how to solve this problem in local language, using a number line.</td>
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<thead>
<tr>
<th>Station 4</th>
<th>Challenge:</th>
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<tbody>
<tr>
<td>Solve 35 + 13 using bundles and straws on an addition frame or mat.</td>
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<tr>
<td>Teachers should quickly make the addition frame on a blank piece of paper. Use local language.</td>
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<thead>
<tr>
<th>Station 5</th>
<th>Challenge:</th>
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<tbody>
<tr>
<td>Explain using bundles and straws and a place value mat why 52 is not the same as 25.</td>
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<tr>
<td>Use local language.</td>
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<thead>
<tr>
<th>Station 6</th>
<th>Challenge:</th>
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<tbody>
<tr>
<td>What can you say about the number 11?</td>
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<tr>
<td>Teachers should describe and represent the number 11 in at least 5 different ways to succeed.</td>
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<thead>
<tr>
<th>Station 7</th>
<th>Challenge:</th>
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<tbody>
<tr>
<td>Solve 67 - 25 using bundles and straws and a subtraction frame.</td>
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</tr>
<tr>
<td>Teachers should quickly make the subtraction frame on a blank piece of paper. Use local language.</td>
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<thead>
<tr>
<th>Station 8</th>
<th>Challenge:</th>
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<tr>
<td>Play “Race for 99” and “Race to 0” (see P2 weekly schemes of work, weeks 4 and 6) using bundles of 10s and 1s and a place value mat.</td>
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<tr>
<td>Explain how this activity teaches or reinforces place value and how teachers might do this activity with a large class.</td>
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Session 9: Local Language

Local language resources (20 min)
- Dr. Mereku will share any resources that he has with his group (share with Juliet)
- A coach will present the small glossary of terms that was developed earlier in the week.

Enrichment of glossary (30 min)
- Divide the participants into groups of 5.
- Facilitators will have to decide the best way to form the groups. It may be beneficial to have groups that represent not only different grade levels, but also different schools
- Each group should review the terms and enrich the language where possible
- Notes should be submitted to Dr. Mereku or Juliet

Practise leading a new learning activity in local language (40 min)
- Teachers should change groups to work with teachers of their same grade level. No more than 5 per group.
- Ask teachers to develop a new learning activity for Week 1 of Term
- Find the activity descriptions: P1 – find N10. P2 - find N9 (Week 1)
- What variations of this learning activity would you propose (for P1 Term 2 Week 1 N10)?
  - Play “What is missing?”
  - Put 3 or 4 repeating element shape pattern on board.
  - Have pupils identify missing shape and justify their thinking.
  - Repeat activity with number patterns (e.g.: 2 4 6 __ 4 6 2 4 6). Play activity often during the week, alternating shapes and numbers.
- Ask teachers to practise doing these activities in local language.
Session 10: Classroom Management

Initial activity (10 min)

- Put the following problem on the flip chart: **Something is going on at school! There are motorbikes and cars parked in front. When Francis arrives, he sees there are 20 wheels. How many vehicles are there?**
- Ask the teachers:
  - Turn to the person next to you.
  - Work with your partner to solve the problem.
  - Discuss how you got your answer and be ready to explain it to the group.
- Select a teacher to solve and explain the answer to the group.
- Ask: **Did anyone solve this problem a different way? Did anyone get a different answer?** What is the advantage of giving pupils problems that: 1) can be solved in more than 1 way and 2) can have more than 1 answer?

Discussion (20 min)

- How did we solve the problem? *(By discussing in pairs)*
- Do you think that both individuals in the pair were engaged in finding the answer? *(Yes)*
- How many people in the class explained their answer? *(Everyone had the chance to explain their answer to another person)*
  1. This is important because each individual gets the chance to solve and explain. Pairs work allows for both partners to be engaged.
  2. Children can learn from one another. Their explanations are often expressed in a way that other children understand.
  3. Pairs work is less work! *(for teachers)*

Brainstorm and Discussion. (30 min total)

What can you do as a teacher to ensure that pairs work is effective?
What strategies can you use in the classroom? *(10 min)*

Note suggestions from teachers. (20 min)

Here are some suggested strategies:
- **Establish regular pairs so you can quickly say: turn to your partner.**
- **Consider matching partners of lower and higher ability**
- **Name the partners A and B. You can give them different roles. Eg. A could add the tens in the addition frame and B could add the ones.**
- **To control noise, ask children to speak quietly to their partners. Say that when you are passing by at an arm-length away, you should not be able to hear them!**
- **Go round the classroom while children are working to provide guidance**
Session 11: Looking Ahead

Looking Ahead (20 min)
- Looking ahead – note different activities, dates.
- Discuss FOI – why it happens, etc.
- Discuss resources: SMS activities continue, Videos – we’re trying to find effective strategies to share videos – we know they don’t work for everyone.
- Surveys via WhatsApp at least for coaches.
- Discuss Community Numeracy Volunteers

Support (20 min)
Do you have what you need to complete the next steps? The lesson planning, the Learning Circles, the Coaching Sessions?
- Are there gaps?
- What will help fill those gaps?
- Who? (Which actors are in the best position to help?)
- How can we help one another?
End of Training

Evaluation (15 min discussion + 10 min written)

- How was the training for you?
- What was the most significant part of the training for you?

Please fill out the written evaluation.