BACHELOR OF EDUCATION (TEACHING) PRIMARY 2013

LTCS 5122 - Learning & Teaching: Mathematics and Statistics

bti bethlehem tertiary institute
TE WHARE TAUIRA O PETEREHEMA

BACHELOR OF EDUCATION (Teaching)
Primary

LTCS 5122 Learning and Teaching: Mathematics and Statistics

2013

Teacher Educator:
Alaster Gibson

BETHLEHEM INSTITUTE OF EDUCATION
Te Whare Tauira o Peterehema

BACHELOR OF EDUCATION (Teaching)
Primary

COURSE TITLE: LTCS 5122: Learning and Teaching: Mathematics and Statistics

CREDITS : 15 Credit Points

PRE-REQUISITES: NIL

PROGRAMME RATIONALE:
The BTI Bachelor of Education (Teaching) Primary programme prepares teachers who are learners, leaders and professionals committed to students learning in New Entrant to Year Eight classrooms and with the NZ Curriculum. The programmes foundational Conceptual Framework provides the basis for coherence across courses within the programme and seeks the development of wise educators who are gracious, secure and teachable and whose teaching is relational, transformative and responsive. Inherent within this is a commitment to critical reflection, consistent with a Biblical worldview and the aspirations stated within NZ Teachers Council 'Graduating Teachers Standards: Aotearoa, New Zealand'.

COURSE DESCRIPTION:
Effective primary teachers demonstrate a working knowledge of mathematics and mathematical literacy (number and algebra, measurement and geometry, and statistics). They are reflective practitioners, who are responsive to the diverse needs of learners of mathematics. This course provides opportunity for students to examine mathematical content knowledge, practical materials, assessment tools, and effective pedagogy through a variety of contexts as well as exploring a Biblical Christian perspective. Students will be able to describe and demonstrate a range of approaches to appropriate and differentiated planning of mathematics for effective learning in mathematics.

LEARNING INTENTIONS:
In keeping with the above rationale, the learning intentions are for students to:

1. Discuss and engage with the achievement objectives and content for mathematics and statistics across the strands and levels 1-4 of the New Zealand curriculum.

2. Discuss and apply Christian biblical perspectives of mathematics, pedagogical models and practical resources that inform and support effective teaching and learning of mathematics.

3. Participate in and reflect on a range of practical micro-teaching teaching and learning opportunities in which mathematical knowledge and strategies are planned, taught, assessed and evaluated.

COURSE CONTENT:

LTCS 5122: LEARNING AND TEACHING: MATHEMATICS and STATISTICS			
Week	Lecture	Topic	Readings, revision & reminders
Mon 18 Feb 1-3pm	1	Introduce curriculum strands, levels, achievement objectives. Christian Biblical perspectives Part 1.	Purchase a maths exercise book with squares in it, plus pencil, rubber, ruler Go to BTI online & review lecture material & readings.
Fri 22 Feb 8:30am	2	Maths games Numeracy pedagogy Online support 'Study ladder.'	
Mon 25 Feb 1-3 pm	3	Numeracy strategy stages (counting) Numeracy strategy stages (part-whole)	Review DVD clips on strategy stage levels.
Fri 1 March 8:30am	4	Numeracy diagnostic assessment tools. JAM, Gloss, IKAN	Reading: Junior maths assessment. http://nzmaths.co.nz/junior-assessment-mathematics?parent_node=
Mon 4 March	5	Numeracy weekly group scheduling Christian biblical perspectives Part 2.	Forum 1:Christian biblical perspectives on mathematics in the created world.
Fri 8 March	6	Maths games Teaching number knowledge (resources and equipment).	Reading: nzmaths material on number knowledge content, progressions, and planning.
Mon 11 March	7	Micro-teaching (1) Maths game and GLOSS & IKANS tests with two Y4 children from BC Primary school.	Analyse diagnostic data, prepare an informed lesson plan for micro-teaching session #2.
Fri 15 March	8	Maths games Teaching addition, subtraction & place value	Make up several addition/ subtraction/ games/activities.
Study Week 18-22 March		**Self-directed study week** Preparation for micro-teaching sessions 1 and 2. Online diagnostic numeracy testing material IKANS and GloSS.	Purchase ONE of the New Zealand curriculum mathematics texts and ONE of the Dragon maths texts.

Mon 25 March	9	Maths games Teaching addition, subtraction & place value Part 2.	Micro-teaching preparation.
Fri 29 March Meet 4210 8:30am		Public holiday	
Mon 1 April		Public holiday	Micro-teaching preparation this week
Fri 5 April Meet 4201 8:30am	10	Micro-teaching (2) lesson based on either +/- or number knowledge suitable for the two children from MT 1.	Write up your micro-teaching reflections.
Mon 8 April	11	Planning differentiated multiple group weekly schedules. Introduction to assignment 1	Reading: nzmaths online material on unit planning.
Fri 12 April	12	Practical planning session for multi-groups numeracy weekly plan assignment using the New Zealand Curriculum mathematics texts. Library support and tutorial support.	Invite PM & LB Ensure you have purchased one of the NZCM texts either stage 5, Stage 6 or or 7 (book 1 or 2). Bring these texts to this planning session.
Mon 15 April	13	Maths games Teaching multiplication & division Part 1.	Reading: nzmaths online material on mult/div re concepts, progressions, planning
Fri 19 April	14	Teaching multiplication & division Part 2 Rotation stations Social learning theory.	Make up several mult/div maths games/activities.
22-26 April		**Study break**	Recommend work on assignment 1
29 April – 3 May		**Study break**	
Mon 6 May	15	Maths games Teaching fractions, decimals, and	Reading: nzmaths material on fractions, concepts, progressions and planning.

		percentages Part 1	
Fri 10 May	16	Teaching fractions, decimals, and percentages Part 2	Make up several fraction games/activities.
Mon 13 May	17	Teaching fractions Part 3 rotation learning stations	
Fri 17 May	18	Teaching algebra across levels 1-4 Part 1	Reading: nzmaths material on algebra.
Mon 20 May	19	Teaching algebra Part 2 Rotation learning stations Enrich-e-matics resource.	
Fri 24 May	20	Micro-teaching (3) Plan and teach a lesson on multiplication and/or division with two Y5 children.	The children and their specific learning needs are unknown but prepare flexibly for level 3 of the curriculum and the advanced additive strategy stage. Complete evaluation of micro-teaching.
Mon 27 May	21	The affective domain on engagement and progress in maths. Reading: Annenberg media (2009). Affective domain in the mathematics classroom.	Forum 2: Self-reflection on attitudes and feelings towards maths.
Fri 31 May	22	Micro-teaching (4) focus on same two Y5 children but this time teaching fractions & decimals.	Complete evaluations of micro-teaching. Submit part one of micro-teaching assignment.
3 June – 5 July		**Practicum 1**	
8 – 26 July		**3 week Study break**	Recommend work on Assignment 1
Mon 29 July	23	Measurement (1) understanding linear measurement, area, volume in a range of units. Problems solving.	Forum 3: Summarise key points from reading by Anthony & Walshaw (2007) Effective pedagogy in mathematics.
Fri 2 Aug	24	Measurement (2) Exploring measurement outside the classroom. Drawing vehicle to scale, speed and basic clinometers.	Read nzmaths material on measurement.
Mon	25	Measurement (3)	Assignment 1: Multiple group weekly

5 Aug		Understanding mass and weight in various units. weight (mass). Problem solving. angles,	maths plan due Thursday 8th August, 2013.
Fri 9 Aug	26	Measurement (4) Understanding angles, capacity, temperature & time. Problem solving activities.	Preparation for peer group instructional lesson presentations.
Mon 12 August	27	**Tutorial time with teacher educator** to discuss micro-teaching or any aspect of measurement. OR self-directed study to go to BTI online and explore various resources and readings for measurement.	Reading: Neil (2005) Journaling in mathematics.
Fri 16 August	28	Micro-teaching session (5) Plan and teach lesson on measurement. Small group of Y5-6 children.	
Mon 19 August	29	Assignment 1: Peer group instructional lesson presentations.	Basic equipment needed. 1 metre tape, 30 cm ruler, compass, protractor (180 & 360 degrees).
Fri 23 Aug	30	Assignment 1: Peer group instructional lesson presentations.	
26-30 Aug		**Study self-directed week**	Create several maths games
Mon 2 Sept	31	Geometry (1) Curriculum content L1-4 Examine shape/form – constructing 3D polygons & polyhedral.	Make up 2 measurement games suitable for levels 2-4.
Fri 6 Sept	32	Geometry (2) Examine position and orientation. Geometry in PE Orienteering.	Read through online material
Mon	33	Geometry (3) Examine	Practice solving geometry problems

9 Sept		various transformations.	from levels 2-4 of the curriculum. See examples in NCM and AWS texts in bti library plus NZCER tests.
Fri 13 Sept	34	Geometry (4) in art: Tapa patterns, symmetrical designs and filography.	Make up 2 geometry games/activities suitable for levels 2-4.
Mon 16 Sept	35	**Tutorial time with teacher educator** to discuss micro-teaching or any aspect of geometry. OR self-directed study to go to BTI online and explore various resources and readings for geometry.	Planning for micro-teaching
Fri 20 Sept	36	Micro-teaching (6) Plan and teach small group lesson on geometry. Y5-6 children.	Read through online material
Mon 23 Sept	37	Introduction to national standards for mathematics. Overall teacher judgments (OTJs). Discuss teacher/student/parent interviews, and samples of school reporting.	Reading: Go online to nzmaths and read through material on national standards.
Fri 27 Sept	38	Exploring Figure it out booklets and geometry, measurement and statistics.	
30 Sept – 11 Oct		**Two week study break**	
Mon 14Oct	39	Statistics (1) Curriculum content L1-4. Known & unknown data.	Read through material online.
Fri 18 Oct	40	Statistics (2) unknown data Developing a suitable inquiry question.	Make 2 statistics/probability type activities/gamers suitable for levels 2-4.
Mon 21 Oct	41	Statistics (3) Co-op group statistical inquiry process,	Forum 4: Publish 1 A4 summary of statistical inquiry include table of data

		unknown data. In small groups of four conduct a simple statistical inquiry. Include visual presentation and tentative conclusions.	and labelled graph.
Fri 25 Oct	42	Probability: Theoretical and actual. Problem solving and application to everyday life.	Make up a couple of probability problem solving cards.
Mon 28 Oct		Public holiday	
Fri 1 Nov	43	Micro-teaching 7 Plan & teach small group lesson on statistics. Y5-6 children.	**Assignment 2:** Micro-teaching portfolio Assignment 2 due Thursday 8th November, 2013.
Mon 4 Nov	44	Exploring tests via e-assTLe and nzcer assessment resource bank	
Fri 8 Nov	45	Test: McIntosh, Reys, Reys, Bana & Farrell (1997). *Number sense item bank*	Participate in forum posting # 6. Reflect on your attitudes and feelings towards teaching mathematics and statistics. Describe any changes that have occurred during the course and what has influenced these changes.
Mon 11 Nov	46	Making maths games and activities bags. Bring ONE puzzle or game of your own to share.	Course evaluations

PLEASE NOTE:
There is an expectation that all set work will be completed, whether this be for in-class preparation, study tasks or assignment submission.

For satisfactory completion of this course, all assignment tasks must be completed and terms met. In the case of a failed assignment, you may, at the lecturer's discretion, be permitted to resubmit the work. However, the resubmitted work may not earn more than a conceded pass (CP).

In academic and professional presentations, plagiarism is considered to be a serious ethical offence. It offends such Christian principles as honesty, integrity and respect for others. Plagiarism occurs when another person's published or unpublished work is used as if it were ones own. It involves (without clear acknowledgment) direct copying, quoting, paraphrasing of material or downloading from the internet, another person ideas.

Plagiarism includes copying from another student's assignments. Cases of plagiarism will be handled according to the guidelines outlined in the Student Policy on Plagiarism.

REQUIRED TEXT:

You are to purchase TWO texts – one from each text listed below.

- Tipler, M. & Timperley, S. (2007). *New Zealand curriculum mathematics.* (series of texts on strategy stages 4-8). Christchurch, New Zealand: Caxton Educational.
- Geldof, W. (2008-12). *Dragon maths: Mathematics and statistics workbooks based on the N.Z. curriculum.* Tauranga, New Zealand: Sigma Publishing Ltd.

These are available online http://www.caxed.co.nz/ or through the Teacher resource centre, Durham St., Tauranga.

REQUIRED READING:

Ministry of Education nzmaths online professional development material http://nzmaths.co.nz/professional-development

Anthony, G., & Walshaw, M. (2007). *Effective pedagogy in mathematics. Best evidence synthesis iterations (BES)*, pp. 55-70. Retrieved from http://www.educationcounts.govt.nz/publications/series/2515/5951

Neill, A. (2005). *Journaling in mathematics.* Wellington, New Zealand: NZCER. Retrieved from http://arb.nzcer.org.nz/supportmaterials/maths/journalling.php

RECOMMENDED READING:

Annenberg Media. (2010). *Teaching strategies: Affective domain.* Retrieved from http://www.learner.org/workshops/algebra/workshop6/teaching.html#2

Gitt, W., (1999). *The wonder of man.* Bielefeld, Germany: Christliche Literatur-Verbreitung E.V. (Readings available via bti online)

Maguire, T. (2007). Understanding the unknown. Looking at algebraic thinking – number properties. *Set 3,* pp. 4-8.

Ministry of Education. (1999- 2010). *Figure it out.* (series of booklets). Wellington, New Zealand: Learning Media.

Spitzer, S., & Roddick, C. (2007). *Succeeding at mathematics. 'What is engagement?'* pp. 32-45. Online book http://tinyurl.com/3aemthf

Tipler, M., & Timperley, S. (2007). *New Zealand curriculum mathematics.* (series of texts

on strategy stages 4-8). Christchurch, New Zealand: Caxton Educational. (One as required text).

Zevenbergen, R., Dole, S., & Wright, R. (2004). *Teaching mathematics in the primary classroom.* Melbourne, Australia: Allen & Unwin.

SECTOR SPECIFIC RESOURCES:

Ministry of Education NZMaths web portal. http://www.nzmaths.co.nz/
nzmaths web site for planning, assessment, professional development, planning, and learning objects.

The New Zealand Council of Educational Researchassessment resource bank of maths assessments. www.nzcer.org.nz

LTCS 5122: LEARNING AND TEACHING: MATHEMATICS and STATISTICS

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ASSESSMENT TASK 1: Weekly multiple group maths plan.

WEIGHTING: 50% (10% peer-assessed instructional lesson and 40% lecturer assessed based on written documentation).

DUE DATE: Written documentation due Thursday 8th August.
Peer assessed instructional lesson presentations due Monday 19th August.

LINK TO LEARNING INTENTIONS: 1, 2, 3.

TASK INSTRUCTIONS:

This is an *individual assessment*. You are required to **plan a comprehensive 1 week numeracy schedule for three ability/needs based groups and a whole class Friday programme.** There are *five parts* to this assignment and a 10 minute oral/visual class group presentation.

Part one:
This assignment requires you to *explore 'differentiated' teaching and learning* in numeracy. It is 'a' way to plan (there are more complex matrices), and in particular a way to *scaffold student teachers* to develop professional understanding of multiple group work in mathematics.

On your weekly planner there will be three ability groups. Each of the three ability groups *rotates* around three learning approaches during the days Monday –Thursday.

- Teacher led instructional group lessons (i.e. a group of 10 children with the teacher on the mat).
- Student practice activities (i.e. 10 children individual/pairs). These provide follow up practice of the concepts taught in the instructional lessons.
- Student independent games/activities (i.e. 10 individuals, pairs or small groups). These are designed to apply or reinforce numeracy knowledge and skills related to the specific instructional content.

This means a total of 4 instructional lessons, 4 practice lessons and 4 independent games/activities lessons for the class Monday – Thursday. (NB: Many classrooms today rotate groups twice per day requiring teachers to plan twice as many group activities… although in practice some groups do the same games/activities.)

For the purpose of this assignment ☺ the three ability groups for Monday- Thursday are intentionally designed around three specific strategy stage levels.

- **Group 1:** early additive strategy stage.
- **Group 2**: advanced additive strategy stage.
- **Group 3**: advanced multiplicative strategy stage

For a tutorial review of these stages click on: http://nzmaths.co.nz/select-stage-and-domain?parent_node= and http://www2.nzmaths.co.nz/frames/onpd/Intro/01.aspx). Note that the NZ curriculum mathematics standards now refers to stage 6 as '*advanced additive-early multiplicative'.*

You are advised to make use of the **NZ curriculum mathematics texts** designed for the instructional and practice lessons for each of these strategy stages. The independent programme material can be sourced from a range of texts and online sites.

Below (next page) there is an A4 sized landscape pro-forma to help guide you through this assignment process. To plan successfully you will need to read up each NZ curriculum mathematics text to see what the three strategy stages and their accompanying number knowledge mean (see yellow pages at the back). You then need to make some decisions as to where you will start, what learning you want to select to be spread across the week. Gather resource ideas, games and activities. You can include material on number knowledge to support the strategies being explored.

You must demonstrate a clear understanding of the material for your instruction lessons by setting out your lesson SLI and sequence of learning activities and diagrams **on a A3 sized pages (similar to a modelling book) which will be placed inside your assignment clearfile.**

For your teacher instructional lessons it is *required that you adapt* (change some of the numbers, re-write some of the number stories) of your instructional content to show that you have engaged with the material. I realize that in real school life this would not normally be the case. However I want you to demonstrate that you have thought through the teaching/learning material for your groups. This does NOT require you to create whole original lesson material. **You are to show your adapted lesson material in blue in your modelling book pages.**

In your modelling book copied examples (which are also permitted ☺) are to be in black. How much of the lesson needs to be 'adapted'? This is difficult to specify due to the variety of lessons that could be developed. As a rough guide, approximately a quarter to a half of the instructional lesson material should be modified.
You do NOT have to modify your **practice group** lesson material or your **independent** material. These can be sourced from the NZ curriculum mathematics texts and other sources e.g. 'Figure it out series'.

BTI: A weekly multi-group numeracy plan pro-forma for assignment 1. Y1 2013					
Curriculum levels **Achievement objectives:** EA = level 2 AA-EM = level 3 and AM = Level 4				**Class:** Hypothetical mixed ability class of 30 children **Theme** of unit:	
Key competencies: From the Curriculum (2007) p, 12-13. Values: From the Curriculum (2007) p. 10. Assessment: Go to the nzcer website http://www.nzcer.org.nz/ and select and print off a suitable summative test for each group.					
Week 1	**Monday**	**T**	**W**	**Th**	**Friday programme:**
Group 1 Early additive (EA)	**Teacher (T)** 30-40 mins Instructional lesson refer to NZ curriculum mathematics text. SLI Strategy &/or number knowledge focus. Learning activities, interactive, use of equipment, problem based and including imaging and application of number properties.	(P)	(I)	(T)	**While most teachers** begin Fri maths with marking home learning & testing tables… For this assignment- you ONLY need to create **ONE Christian biblical maths activity station** involving an article from the CREATION magazines in the bti library.
Group 2 Advanced additive- early multiplicative (AA)	**Independent (I)** 30-40 mins Self-managed learning activities. SLI Typically games & activities, individual or small groups, hard copy or online NB: Includes 10 min reflective journal entry (RJE). You provide the guiding questions..	(T)	(P)	(I)	
Group 3 Advanced multiplicative (AM)	**Practice (P)** 30- 40 mins Follow-up practice (revision and extension) of number knowledge/strategies learnt in previous teacher session. SLI Refer to NZ curric math text, 'figure it out' booklets etc. Plus 10 min. teacher interaction/monitor/feedback	(I)	(T)	(P)	
Class warm-up	A game e.g. 'bowl a fact', 'four in a row'	Quick quiz. Use mental math booklet	A game	Quick quiz	
Home-learning	A different home learning activity per group. Typically might involve a tables list, a learning sheet (e.g. AWS series of booklets on number are popular), a 'juicy puzzle of the week' or some other meaningful revision of class learning.				
End of week teacher evaluation *(not needed for this assignment)*					

Part two:
Friday whole class planning incorporating a Christian perspective on mathematics.

Mathematics is not an isolated curriculum learning area, but is a vital part of the world, cosmos and everyday life. This assessment task has been inspired by three sources.

- Galileo Galilei (1564-1642) an Italian physicist, mathematician and astronomer, who wrote, "Mathematics is the language with which God has written the universe.'
- Secondly, Professor Michael Heller, a cosmologist and philosopher specialising in mathematics and metaphysics, who in 2008 won a prestigious academic Nobel prize for his work in mathematics (refer to article called Professor wins prize for maths link to God, retrieved from http://tinyurl.com/3l368f). Professor Heller's work shows how maths can offer circumstantial evidence of God's existence. His theories do not so much offer proof of the existence of God as introduce doubt about the material existence of the world around us. "If we ask about the cause of the universe we should ask about the cause of mathematical laws." (2008, p.1)
- Thirdly, the bible states, 'For since the creation of the world His (God's) invisible attributes are clearly seen, being understood by the things that are made, even his eternal power and Godhead…' Romans 1:20.

This part of the assignment therefore, builds on the Christian biblical world-view perspective that complex mathematical laws, measurements, and geometric properties within the world argue for of an intelligent supernatural origin of the world. That is, the existence of amazing maths in the world provides strong evidence of a mathematically brilliant creator whom the Bible declares is the one, true, living God (Daniel 6:26). This Christian world-view perspective holds that it is logically and empirically reasonable to believe that the mathematical laws and properties could not have formed themselves by accident. This Christian biblical world-view perspective is therefore diametrically opposed to humanistic and naturalistic world-views that deny God's existence and 'believe' that the world came into existence by impersonal accidental natural processes over billions of years.

The Friday part of a weekly math plan is designed to break the mould of ability group planning and focus on whole class learning activities catering for *mixed ability and social grouping.* For this part of the assignment you ONLY need to create ONE activity (lasting approx. 20 mins.) pitched at a reading ability between 12-15 years (level 3-4 of the curriculum). The activity MUST include the following.

- A reading from an article from a '**CREATION' magazine** (available in bti library) that discusses *mathematical evidence* for intelligent design in either animals, humans, the world or the cosmos. Print this out and annotate the article underlining key vocabulary and key concepts.
- Provide child friendly instructions for the children explaining how they will first read the article and what key words and concepts they will need to discuss to ensure they understand the text.
- Provide two mid to high order questions that will engage the children in thinking about the idea that the mathematics involved in the created world, as

reported in the article, provides evidence for intelligent design and an intelligent designer – namely God. In other words challenge them to think about God and their response to this evidence of God.

- Provide 5 related and appropriate maths problems based on the information in the creation magazine article and pitched at Levels 3-4 of the curriculum for the children to solve.

Part three: All teachers need to think about how they will assess the children learning. This may be done informally through observations and interactions in class, marking book work and formally through tests. Go online to the NZCER web site (http://www.nzcer.org.nz/) and select an appropriate summative **test for each of your three ability groups** from the assessment resource bank. Include a print out of these in your clearfile.
User name = arb Password = guide

Part four: Plan your warm up activities for Monday-Thursday. This involves you making a choice of two whole class-but small group based games and some quick quizzes suitable for each of the three ability groups. These can be copied from the games that I have or that you obtain elsewhere. For the purpose of this assignment the quick quizzes (one on Tues and the other Thurs) are to comprise 10 questions for each of the three ability groups. These quiz questions may be photocopied (and then highlight the ones you want to use) from the mental arithmetic booklets available in the BTI library. (e.g. booklet 5 will be suitable for AA and AM). You can make up your own quick quiz lists if you want to.

The idea here is to get you to recognise there are various ways of doing warm-ups. You don't always have to have a game. The quick quiz needs to be differentiated. In the real life of class teaching the teacher would call out two groups while the third group could be called out by a student.

Part five: Plan ONE **home learning** activity for EACH of your ability groups. Home-learning policies vary from school to school. For the purpose of this assignment plan a 15-20 min (approx.) home-learning activity sheet for each of the three ability groups that relates to the lessons your have planned. Teachers typically give out home-learning on Monday and mark it on Friday. This may simply be a tables list, a juicy number problem/puzzle (check on line for these or source from a suitable maths text) or a photocopied sheet from the AWS series of texts available in the BTI library.
Be sure to reference your resources. The challenge is to select **meaningful revision** of the children's learning they have been receiving in class.

Part six: A 250 word critical reflection of your learning as you journeyed through this comprehensive assignment and it's help in preparation for planning, teaching, learning and assessment in mathematics.

What you need to submit:
All your assignment work is to fit into an ***A3 sized clearfile***.

A3 clear-file: Divide the clear-file into the following clearly labelled sections.
Part one.

- Page 1: An A3 sized, printed weekly multiple group maths plan in which you concisely identity or summarise content. E.g name of warm up activities, home learning activities, group lesson SLI and example of learning content, page number, questions etc., AOs and other curriculum links as shown on the pro forma. The details of these parts of your pro forma will be provided in the following sections ☺.
- Page 2: Early additive group: The practice and independent lesson material in this section only. The teacher instructional lesson details will be written up in your modelling book.
- Page 3: Advanced additive-early multiplicative group: The practice and independent lesson material in this section only. The teacher instructional lesson details will be written up in your modelling book.
- Page 4: Advanced multiplicative group: The practice and independent lesson material in this section only. The teacher instructional lesson details will be written up in your modelling book.

Part two. Page 5: Friday integrated Christian perspectives article, questions and personal reflections.

Part three. Page 6: NZCER assessment resource bank test sheets that you have printed off and labelled for each of the three ability groups. Remember these must relate to the material each group has been learning that week. PLUS your five reflective journaling questions.

Part four. Page 7: Whole class warm up activities for Monday – Thursday; Photocopy of two class games and quick quiz questions suitable for each ability group.

Part five. Page 8: ONE home learning activity for each ability group.

Part six. Page 9: Your personal 250 word summative reflection based on this assignment.

A3 sized modelling book pages for instructional lessons:

- Page 1-2: Early additive instructional lessons 1 and 2.
- Page 3: Advanced additive-early multiplicative instructional lesson 1.
- Page 4: Advanced multiplicative instructional lesson 1.

Each of these sections will contain details of your instructional lessons (SLI at the top, equation examples and diagrams such as blocks, number lines, sets etc of the new learning, key teaching points etc.) These can be sourced from the NZ mathematics curriculum texts but remember to show adapted work in blue and copied material in black.
Please do not staple any sheets together.

Game boards and instructions can be photocopied and slipped into the clearfile– no need to include equipment like dice and counters.

Peer assessed class group presentation: A 15 minute instructional lesson simulation based on ONE of your instructional lessons you have planned. You will have a small group of peers who will pretend to be your students. Introduce the age/stage level of the lesson. Then proceed to teach your lesson demonstrating clear use of mathematical language supported by working examples on the white-board and/or your modelling book. You are to engage your peers in thinking, using equipment and in solving real life problems- just like you would in the classroom.

Presentation must keep to the time frame.

Peer assessment criteria will be provided during the course. The intention here is to provide you with an opportunity to clearly express your professional understanding of teaching maths.

STUDENT NAME: **GRADE:**

<table>
<tr><th colspan="4">ASSESSMENT STANDARDS:</th></tr>
<tr><th>A category</th><th>B</th><th>C</th><th>Fail category</th></tr>
<tr><td>Meets criteria (outstanding, insightful, profound) Articulation (masterful, polished, sophisticated). Organisation (focussed, tightly organised). Develops many aspects (significantly, in depth)</td><td>Meets criteria (consistently – often) and develops (some, key, or a number of) aspects</td><td>Meets criteria adequately at beginning level</td><td>Criteria not met</td></tr>
<tr><td colspan="3">Assessment Criteria: Clear-file AND modelling book.
Grading is based on the extent to which there is evidence of:
• A consistently comprehensive, written multi-group week plan that includes suitable AOs, SLIs, learning content, activities, games and resources.
• Informed and accurate professional understanding of the pedagogy and number knowledge content associated with each of the three numeracy strategy stage group lessons.
• Consistently accurate and visually effective instructional teaching content within the modelling book.
• Appropriate selection of meaningful home learning activities and in-class, warm-up activities.
• Appropriate selection of assessment resource bank tests for each group that</td><td>FEEDBACK:</td></tr>
</table>

meaningfully connect with each groups' learning focus for the week. • Thought provoking reflective journaling questions suitable for children to respond to as a tool for self-assessment in maths. • An appropriately selected and wisely annotated CREATION magazine article that provides resource evidence for intelligent design through consideration of mathematical information related to the world around us. • Appropriately crafted and engaging questions related to the article and a meaningful selection of maths problems for levels 3-4 of the curriculum. • In-depth, critical reflections of your own professional growth and personal confidence in planning, teaching and assessing several strategy stage levels of mathematics.	
OVERALL COMMENT:	

LTCS 5122: LEARNING AND TEACHING: MATHEMATICS and STATISTICS

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ASSESSMENT TASK 2: Micro teaching Portfolio

WEIGHTING: 50%

DUE DATE: Thursday 7th November, 2013.

LINK TO LEARNING INTENTIONS: 1, 2, 3.

TASK INSTRUCTION:

- **This assignment requires you to develop a teaching portfolio of seven micro-teaching sessions.** The first four micro-teaching lessons will have a numeracy focus and include diagnostic assessment and engagement with numeracy pedagogy and numeracy concepts of addition/subtraction/multiplication/division/fractions and decimals. The fifth, sixth and seventh micro teaching lessons will focus on measurement, geometry and statistics.

For each teaching session you will work **independently** with 2-3 children at various levels of the primary school.

Part 1: The micro-teaching sessions 1 and 2 will be related to numeracy at the advanced counting-early additive strategy stage levels. Students will work with two Y3-4 students. Micro-teaching sessions 3, 4 and 5 will involve Y5/6 children working at the AA-AM strategy stages for mult/div. and fractions/decimals.

Micro-teaching #1
Plan and introduce a numeracy related warm up game.
Plan and conduct a diagnostic test. (JAM, GloSS and IKANS)
Afterwards analyse the test results and work out the children's number knowledge and strategy stage levels.

NB: It is recommended you conduct the game together to start with, then do the IKANS together then go through the GloSS test individually. Have an activity for the other student to do while you carry out the GloSS test. Finish with another 'together' game if time/energy permits.

Micro-teaching #2
Plan and teach a numeracy related lesson (on either +/-) pitched at an appropriate level based on diagnostic results. See online nzmaths lesson activities to help.
This lesson must include a SLI, some materials, **use of a modelling book**, real life number problems and if time allows extend into shielding/imaging and exploring of number properties with harder examples.

What to submit:
The results of the JAM, IKANS and GloSS tests and a 100 word (approx.) 'tentative' explanation of what the results indicate in terms of the numeracy abilities/needs of each child.
A detailed lesson plan for session 2. Include SLI, resources, lesson sequences, teaching points where appropriate.
Include a photocopy of your modelling book work that you used to support the children's learning in session 2.
A one page (approx. 300 words) professional critical reflection of your first and second micro-teaching experiences. What insights did you gain into children's understanding of number? W.r.t session 2 why is it important to explain the SLI first, use materials and then progress to imaging? Why are real life problems important?

Micro-teaching #3
Plan, teach and critically reflect on a lesson suitable for Y5/6 children revising concepts of multiplication and division. Be prepared for a range of ability levels and approach the session interactively and diagnostically to find out the children's prior knowledge and where they need extending. Prepare several learning activities that involve problem solving with everyday topics that can be adapted to suit the needs of the students. Include a warm up game on mult/div.
Submit a detailed lesson plan and a 1 page (approx. 300 word) reflection on this teaching experience. Be sure to reflect on your perception of the children's learning needs and your own professional skills as teacher.

Micro-teaching # 4
Plan, teach and critically reflect on a lesson suitable for Y5/6 children involving concepts of fractions and decimals. Be prepared for a range of ability levels and approach the session interactively and diagnostically to find out the children's prior knowledge and where they need extending. Prepare several learning activities that involve problem solving with everyday topics that can be adapted to suit the needs of the students. Include a warm up game on fractions/decimals.
Submit a detailed lesson plan and a 1 page (approx. 300 word) reflection on this teaching experience. Be sure to reflect on your perception of the children's learning needs and your own professional skills as teacher.

Part 2:

This part of the assignment will be completed during semester 2.

With reference to course material, nzmaths, and various texts, plan, teach and reflect on three 45 minute micro-teaching lessons with a small group of two-three Y5-6 children from a local primary school.

Each session will have a different focus in the following order to fit in with the course schedule.

1. Measurement
2. Geometry

3. Statistics

Your lesson plans need to include an appropriate achievement objective from the curriculum, a specific learning intention (1 per lesson), appropriate instructional content with teaching points, meaningful learning activities for the students, opportunity to integrate key competencies and values, and formative assessment feedback ideas.

What to submit: (Typed sheets in same clearfile as micro-teaching lessons 1-4) no staples, no USB sticks.

For micro-teaching sessions 5, 6 and 7 submit.

- Your full comprehensive lesson plans (include description of resources used NOT the actual resources).
- 3 x 300 word (approx.) critical reflections. After each of these micro-teaching sessions critically reflect on your commitment, preparation, mathematics teaching and the children's mathematics learning. How has each micro-teaching experience contributed to your professional growth as a teacher? How has the experience helped your understanding of the teaching and learning of mathematics?

ASSESSMENT CRITERIA:

Assessment rubric				
	A+ to A-	**B+ to B-**	**C+ to C-**	**Fail**
Planning of AOs, SLIs, KC and values.	Micro-teaching lesson plans consistently demonstrate informed and appropriate AOs, SLI's, KC, values and biblical Christian perspectives.	Micro-teaching lesson demonstrate suitable AOs, SLI's, KC, values and Christian biblical perspectives.	Micro-teaching lesson plans demonstrate some inappropriate and/or unclear AOs, SLI's, KC, values and biblical Christian perspectives.	Micro-teaching lesson plans are incomplete with inappropriate/ inaccurate AOs, SLI's, KC, values and biblical Christian perspectives.
Planning of resources	Micro-teaching lesson plans consistently provide clear evidence of suitable resources to effectively support achievement of the learning intentions.	Micro-teaching lesson plans provide evidence of suitable resources to support achievement of the learning intentions.	Micro-teaching lesson plans provide evidence of some useful resources related to the learning intentions.	Micro-teaching lesson plans are under-resourced and/or show unsuitable resources that do not relate to the learning intentions.
Planning of lesson content and pedagogy	Micro-teaching lesson plans consistently demonstrate informed and appropriate mathematical content and pedagogy.	Micro-teaching lesson plans demonstrate understanding of mathematical content and pedagogy	Micro-teaching lesson plans provide basic beginning level of understanding of what will be taught and how.	Micro-teaching lesson plans provide unclear and/or inadequate detail of what will be taught and how.
Feedback: **Grade:**				

Terms:
Attendance on all 7 micro-teaching sessions.
Participation in at least 4 out of the 6 online forums.
Attendance at peer presentations.

Time allocation:

Lectures	=	70
Micro-teaching and portfolio	=	30
Assignment preparation1 Weekly unit plan	=	30
Self-directed study, forums and readings	=	20
		150 hours

GREAT PLACE, GREAT PEOPLE, GREAT HEARTS + MINDS

Wāhi Hira, Tangata Rawe,
Ngakau Manawa Hiranga

bethlehem tertiary institute
TE WHARE TAUIRA O PETEREHEMA