EDMA401: Assessment Task 2

Lecturers: Prof Doug Clarke and Ms Anne Roche

Evidence for focus standard 3

Maths Trail

Year 3/4

at

St Patrick’s Cathedral
1 Cathedral Place
East Melbourne VIC

Karen Mahony (S00123895)

and

Samantha Griffin (S00122322)
Introduction

This maths trail is located at St Patrick’s Cathedral in Melbourne and focused at year levels 3/4. The students are to complete the trail in pairs pre-chosen by the teacher based on either behavioural or ability groupings. Careful student pairings will assist collaboration, behaviour and in turn have a positive impact on students’ behaviour and noise levels within the Cathedral.

The trail should take approximately 45 minutes and the questions can be answered in any order.

There are 2 versions of this trail; one version for students, one version for teachers with includes annotated notes and keys for assessment.

Focus area 3.3

Excursion Maths trail as a teaching strategy to engage children in their learning.

 Learning and curriculum links outlined below.

The St Patrick’s Cathedral maths trail will provide students with the opportunity to develop their understandings within mathematical content strands, or foci, and make connections between these understandings and real life contexts.

Where is the maths?

This maths trail could be used to introduce, develop or extend upon the following mathematical foci; number, measurement and geometry.

Number:

- Number and place value through calculation of dates
- Estimation and reasoning
- Multiplication using mental and written strategies
- Skip counting

Measurement and Geometry:

- Converting time from analogue to digital
- Visualising and naming 2 dimensional shapes
- Interpreting and representing icons on a grid map
- Using and creating reference points
• Working with and creating icons for a legend

Australian Curriculum links

Number:

Number and place value:

Grade 3: Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies (ACMNA057)

Recall multiplication facts of two, three, five and ten and related division facts (ACMNA056)

Grade 4: Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems (ACMNA073)

Measurement and Geometry:

Units of Measurement:

Grade 3: Tell time to the minute and investigate the relationship between units of time (ACMMG062)

Grade 4: Convert between units of time (ACMMG085)

Use am and pm notation and solve simple time problems (ACMMG086)

Location and Transformation:

Grade 3: Create and interpret simple grid maps to show position and pathways (ACMMG065)

Grade 4: Use simple scales, legends and directions to interpret information contained in basic maps (ACMMG090)

Create symmetrical patterns, pictures and shapes with and without digital technologies (ACMMG091)

Shape:

Grade 4: Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies (ACMMG088)
TRIALLING DETAILS:

When: Tuesday 3\textsuperscript{rd} of February
By whom: Hannah Cantwell and Brianna Robinson
STUDENT INTRODUCTION

St Patrick’s Cathedral, East Melbourne maths trail is to be undertaken with your allocated partner.

The maths trail begins and ends at the outside statue of Archbishop Mannix as shown on the map.

You have 45 minutes in which to complete the maths trail.

You must attempt all questions and they can be done in any order.

*Remember, St Patrick’s Cathedral is a sacred place and we must be respectful to the members of the public who may be in and around the building by using your *quietest* inside voices.*

**Materials and equipment:**

- 1 pencil each
- 1 rubber per pair
- Clipboard per pair
- 5 digital cameras to be shared
1. Locate the information board on the western side of St Patrick’s Cathedral.
   Find the date the spires were blessed by Archbishop Mannix.
   Imagine you were born in that year.
   How old would you be this year?
   Show your workings in the space below.

   **Date of blessing:**

   

   **How old would you be this year?** Show your workings.
2. Without individually counting the pews, estimate how many pews are either side of the centre aisle.

Your answer:

How did you calculate your estimation?
3. Estimate how many people will fit in one pew?

**Answer:**

Estimate the total number of people who will fit on all pews in the centre aisle? (Using your estimate from question 2).

Find another pair of students with a different answer and compare answers.

**Whose answer do you believe is more reasonable and why?**
4. Looking at the Cathedral floor plan, locate the check point indicated by a STAR on the eastern side of the building to find a small timber door.
In centimetres, how much do you need to grow before you are too tall to fit through this door?

Answer:

Estimate how old you might be when you are too tall.
Justify your answer.
5. Locate the timber brochure stand in the Cathedral. It is indicated by a SQUARE on the floor plan.

How many sides does this stand have?

Can you name the shape?

If you sliced through this stand horizontally draw the shape it would create.
6. Locate the Cathedral’s organ, High Altar and clock.

Mark their position on the floor plan giving a grid reference for all three.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>GRID REFERENCE</th>
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<tbody>
<tr>
<td>Organ</td>
<td></td>
</tr>
<tr>
<td>High Altar</td>
<td></td>
</tr>
<tr>
<td>Clock</td>
<td></td>
</tr>
</tbody>
</table>

On your floor plan create a legend icon for each of these items and mark them on the floor plan.
7. To the best of your ability, what time is on the clock to the minute indicating am or pm? Please write the time in a full sentence.

Write the time in 24hr digital format.

How did you convert this time to 24hr format?
8. In pairs, take a digital photo of your favourite pattern in the Cathedral.

This pattern could be a section of stained glass, mosaic tiles, timber, etc.

(This image will be used for an in class activity.)

If you have time, draw this pattern in the space below.
Appendix 3.

MAP OF ST PATRICK’S CATHEDRAL, EAST MELBOURNE
Teacher Version

A WEEK BEFORE MATHS TRAIL:

Student preparation:
The teacher can scaffold student learning by having a class discussion or brain storm session to introduce unfamiliar words associated with religious buildings and architecture eg: pews, spires. Perhaps develop a word and picture wall.

Some students may not have experienced being in a church building or religious environment, the teacher should discuss the importance of being respectful and reverent whilst in and around St Patrick’s Cathedral. For more contextual connections, liken this environment as being in a cinema. Allow students the opportunity to practice their ‘inside’ voices prior to maths trail.

Student safety and adult supervision for maths trail:
2 school staff plus two additional parents or carers. Invite parents and carers to assist with supervision.

A DAY BEFORE MATHS TRAIL:

Student pairings:
Teacher to allocate student pairings based on ability or behaviour. Advise students of their pairings.

Equipment:
30 pencils per student
15 rubbers (pair)
15 clipboards (pair)
5 digital cameras to share (for photos) – ensure these are fully charged
STUDENT INTRODUCTION

St Patrick’s Cathedral, East Melbourne maths trail is to be undertaken with your allocated partner.

The maths trail begins and ends at the outside statue of Archbishop Mannix as shown on the map.

You have 45 minutes in which to complete the maths trail.

You must attempt all questions and they can be done in any order.

*Remember, St Patrick’s Cathedral is a sacred place and we must be respectful to the members of the public who may be in and around the building by using your *quietest* inside voices.*

**Materials and equipment:**

- 1 pencil
- 1 rubber
- clipboard
- 1 class digital camera per pair of students
1. Locate the information board on the western side of St Patrick’s Cathedral.

Find the date the spires were blessed by Archbishop Mannix.

Imagine you were born in that year.

How old would you be this year?

Show your workings in the space below.

**Date of blessing: 1939**

**How old would you be this year? Show your workings.**

**Assessment:**
- Strategies used to compute the value from 2015-1939.
- Opportunity to gauge level of proficiency and mathematical thinking. For example; place value when moving from 1999 to 2000.
- Ability to locate and correctly identify the date on the information board.
2. Without individually counting the pews, estimate how many pews are either side of the centre aisle.

Your answer:

8 short pews (at the front)
66 long pews
Total number of pews is 72

How did you calculate your estimation?

Assessment:
- Mathematical thinking, estimation and reasoning.

Possible in-class discussion
- Class discussion about estimations and reasonings.
- Discuss ways in which children can calculate an answer and check their estimates.
- Extension: Project an internal image of Cathedral on the interactive whiteboard. Whole class or small group work to calculate the total number of pews within the entire Cathedral and number of people who can be seated.
3. Estimate how many people will fit in one pew?

(The pews are numbered but not sequential and are of varying lengths)

<table>
<thead>
<tr>
<th>Answer:</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 on each short pew, 10 on each long pew</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How many people will fit on all the pews? (Use your estimate from question 2).</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 short pews each seat approximately 5 people (40)</td>
</tr>
<tr>
<td>66 longer pews each seat approximately 10 people (660)</td>
</tr>
<tr>
<td>Approximate total number of people is 700</td>
</tr>
</tbody>
</table>

Find another pair of students with a different answer and compare answers.

Whose answer do you believe is more reasonable and why?

Assessment:
Teacher to look for student ability to:
- Justify their reasoning
- Level of operation
- Reflect and self-assess
- Prepare and contribute to class discussion

Possible in-class discussion
- To estimate and calculate the amount of people who could be seated in the Cathedral.
- Would it be different if they were children or adults?
  What other factors might we need to consider?
  What are some strategies we can use to work it out?
  This activity enables students to use a range of strategies such as skip counting and multiplication and allows teachers to assess student proficiency in understanding concepts, fluency in using operations, problem solving skills and reasoning.
4. Looking at the Cathedral floor plan, locate the STAR check point on the eastern side of the building to find a little timber door.

In centimetres, how much do you need to grow before you are too tall to fit through this door?

Answer:

Estimate how old you might be when you too tall?

Justify your answer.

Assessment: student strategy.
5. Locate the timber brochure stand in the Cathedral. It is indicated by a SQUARE on the floor plan.

How many sides does this stand have?

8

Can you name the shape?

Octagon/ Octagonal Prism

If you sliced through this stand horizontally draw the shape it would create.

Assessment:

- Visualising, creating and naming two-dimensional shapes.

In class activity: See Appendices 1 (octagon net) and 2 (Links to other Learning Areas and General Capabilities)
Locate the Cathedral’s organ, High Altar and clock.

Mark their position on the floor plan giving a grid reference for all three.

<table>
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<tr>
<td>Organ</td>
<td>L6,7,8 acceptable</td>
</tr>
<tr>
<td>High Altar</td>
<td>H4</td>
</tr>
<tr>
<td>Clock</td>
<td>H12,13 acceptable</td>
</tr>
</tbody>
</table>

On your floor plan create a legend icon for each of these items and mark them on the floor plan.

Assessment:
- Students correctly create icons for a legend and correctly plot the grid references.
6. To the best of your ability, what time is on the clock to the minute indicating am or pm? Please write the time in a sentence.

(The clock’s face has no digits and the hands are not very precise)

Looking for student answers to indicate an understanding of time and how to accurately read the minutes and the hours, etc.
Eg: It is half past 1pm
It is 14 minutes past 2pm
It is 10 minutes to 11am

Write the time in 24hr digital format.

For example:
13.30
14.14
10.50

How did you convert this time to 24hr format?

Assessment:
• Student strategies used for conversions
• Being able to identify the correct time without numbers on the clock. Can they determine the time is the same without number representation?
7. In pairs, take a digital photo of your favourite pattern in the Cathedral.

This pattern could be a section of stained glass, mosaic tiles, timber, etc.

If you have time, draw this pattern in the space below.

(This image will be used for an in class activity - See Appendix 2 Links to other Learning Areas and General Capabilities)
Appendix 2.

Integration of other Learning Areas and General Capabilities

Religious Education:

Unit work on Sacraments, Easter, Christmas, Mass and Saints.

- Research project on Archbishop Daniel Mannix.
- Research the liturgical colours and seasons of the Catholic Church.
- Research the Seven Catholic Sacraments.

Mathematics

*Cathedral brochure holder:*
The brochure holder located inside the Cathedral was an octagonal prism. Students could be extended by producing three-dimensional nets from two-dimensional shapes.

*Students’ photos of patterns:*
Students can use the photos they took of their chosen pattern to identify and name two-dimensional shapes.
Students can continue to repeat or extend the pattern by using kinder squares.
Students can use the kinder squares activity to record the unit fractions they identify eg: \(\frac{1}{4}\) and \(\frac{1}{4}\) make \(\frac{1}{2}\) of the circle, and \(\frac{1}{2}\) and \(\frac{1}{2}\) of the square make the whole square.

*Australian curriculum links:*

Years 5: Connect three-dimensional objects with their nets and other two-dimensional representations (ACMMG111)
Years 3: Model and represent unit fractions including \(\frac{1}{2}\), \(\frac{1}{4}\), \(\frac{1}{3}\), \(\frac{1}{5}\) and their multiples to a complete whole (ACMNA058)

Visual Arts

*Students’ photos of patterns:*
Students can recreate and continue their pattern using a variety of art materials and describe their choice of materials and design.

*Australian Curriculum links:*

Years 3 and 4: Present artworks and describe how they have used visual conventions to represent their ideas (ACAVAM112)

English

EDMA401 SEMESTER: Professional Term 1, 2015
Karen Mahony (S00123895) Samantha Griffin (S00122322)
Writing creative activity:

- **You are a builder working on the Cathedral and kept a journal:**
  What were some of the things you were thinking or feeling during construction? How do you feel working at that height? What did you imagine the church would look like? How did you piece it all together? What inspired you? How many other people were working on the Cathedral?

- **What's behind the little wooden door?**
  Imagine what might be located behind the doors. Where might this door lead to?

**Australian curriculum links:**

Year 3: Create imaginative texts based on characters, settings and events from students’ own and other cultures using visual features, for example perspective, distance and angle (ACELT1601)

Year 4: Create literary texts using realistic and fantasy settings and characters that draw on the worlds represented in texts students have experienced (ACELT1612)

**History**

On line research activity:

The construction of St Patrick’s Cathedral began in 1858. Use the internet to find three facts about the world in 1858 eg: transport, communications, clothing, population of Australia, etc.

**Australian curriculum links:**

Year 3 and 4: Pose a range of questions about the past (ACHHS083)

**General Capabilities**

Students are to demonstrate self-discipline by being respectful during the maths trail, work collaboratively in pairs, understand themselves as learners through open-ended questions and communicate effectively when explaining their strategies and reasoning.

**Australian curriculum links:**

**Personal and Social Capabilities:**
Social Management
Self Management
Self Awareness
REFERENCES:

Australian Curriculum

Open ended maths activities 2nd edition, sullivan and Lilburn

St Patricks Cathedral website

Vic Depart of Education (supervision info)