



THE MATHEMATICAL  
ASSOCIATION OF VICTORIA



6-7 DECEMBER

#MAVCON

## Annual Sponsors



CAMBRIDGE  
UNIVERSITY PRESS

**CASIO** EDU  
[www.casio.edu.shriro.com.au](http://www.casio.edu.shriro.com.au)



TEXAS  
INSTRUMENTS



THE MATHEMATICAL  
ASSOCIATION OF VICTORIA

TEACHERS CREATING IMPACT

6-7 DECEMBER

#MAVCON

## KEYNOTE PRESENTATION

**Robyn Jorgensen**

*Bringing about  
success in  
mathematics for  
students in the  
margins: What makes  
for good practice*



# Bringing about Success in Mathematics for Students in the Margins: What makes for good practice?

MAV Conference, Melbourne, 2018

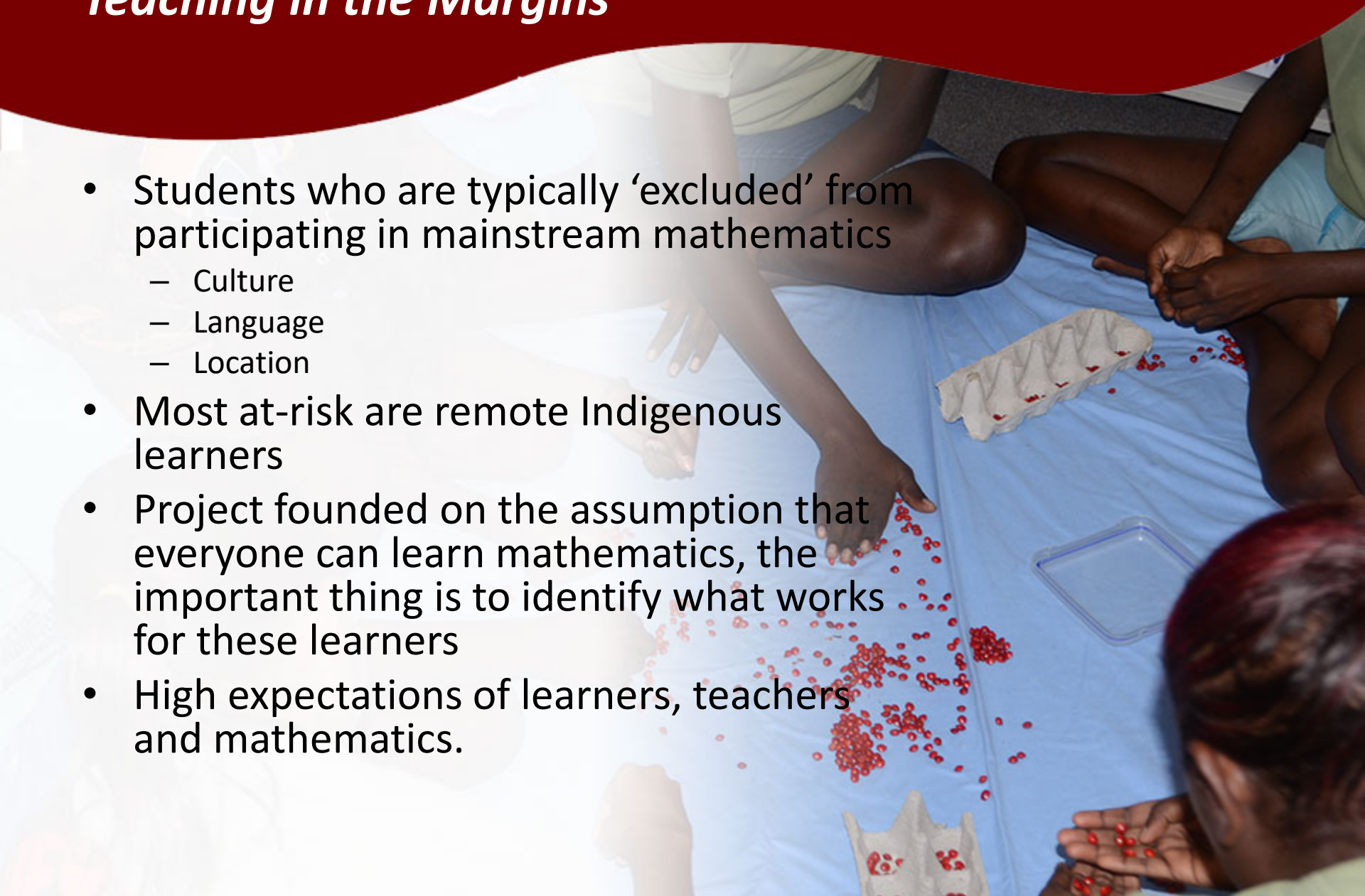
Robyn Jorgensen(Zevenbergen)



[robyn.jorgensen@canberra.edu.au](mailto:robyn.jorgensen@canberra.edu.au)

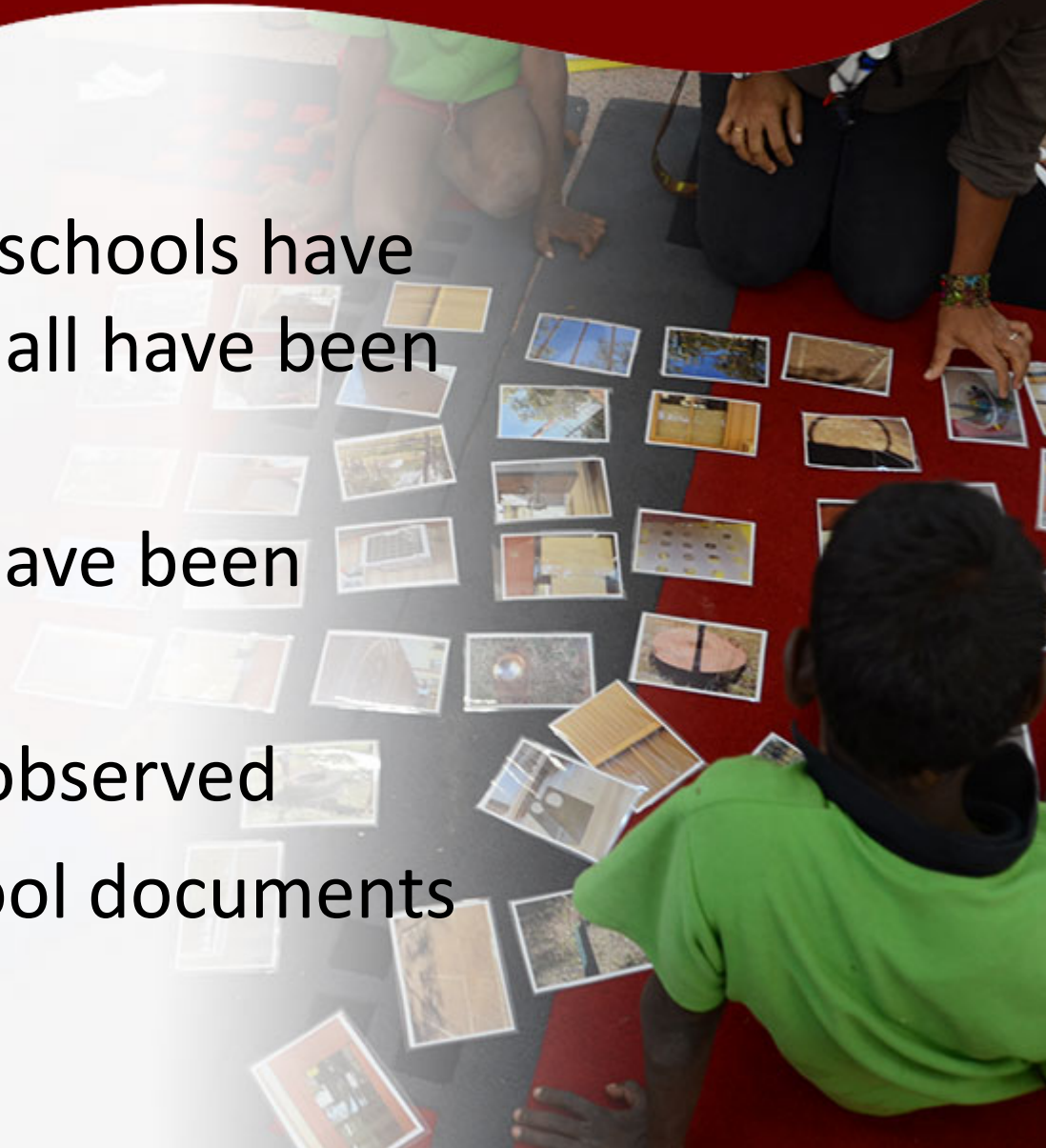
# *Teaching in the Margins*

- Students who are typically 'excluded' from participating in mainstream mathematics
  - Culture
  - Language
  - Location
- Most at-risk are remote Indigenous learners
- Project founded on the assumption that everyone can learn mathematics, the important thing is to identify what works for these learners
- High expectations of learners, teachers and mathematics.



# Remote Numeracy Project

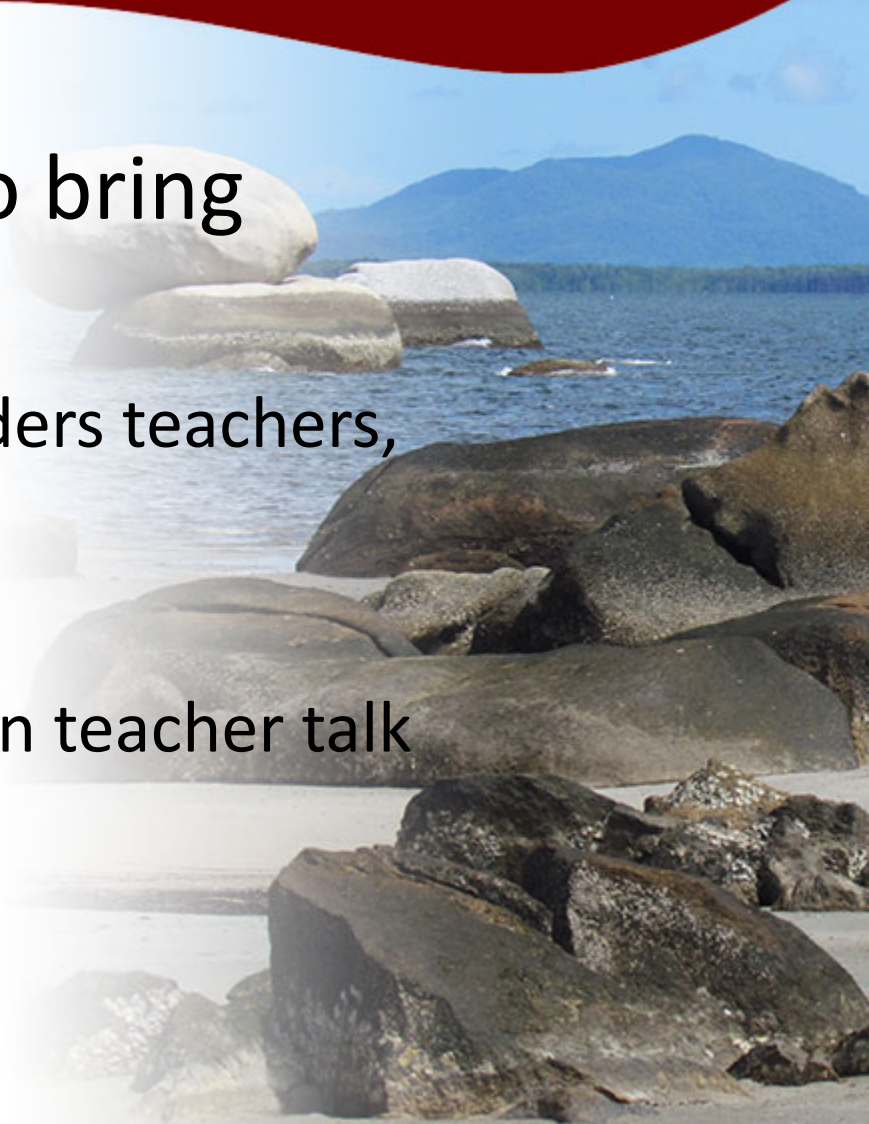
- Approximately 40 schools have been visited – not all have been published.
- Over 250 people have been interviewed
- Over 100 lessons observed
- Mountains of school documents collected.



# Project overview

What are schools doing to bring about success?

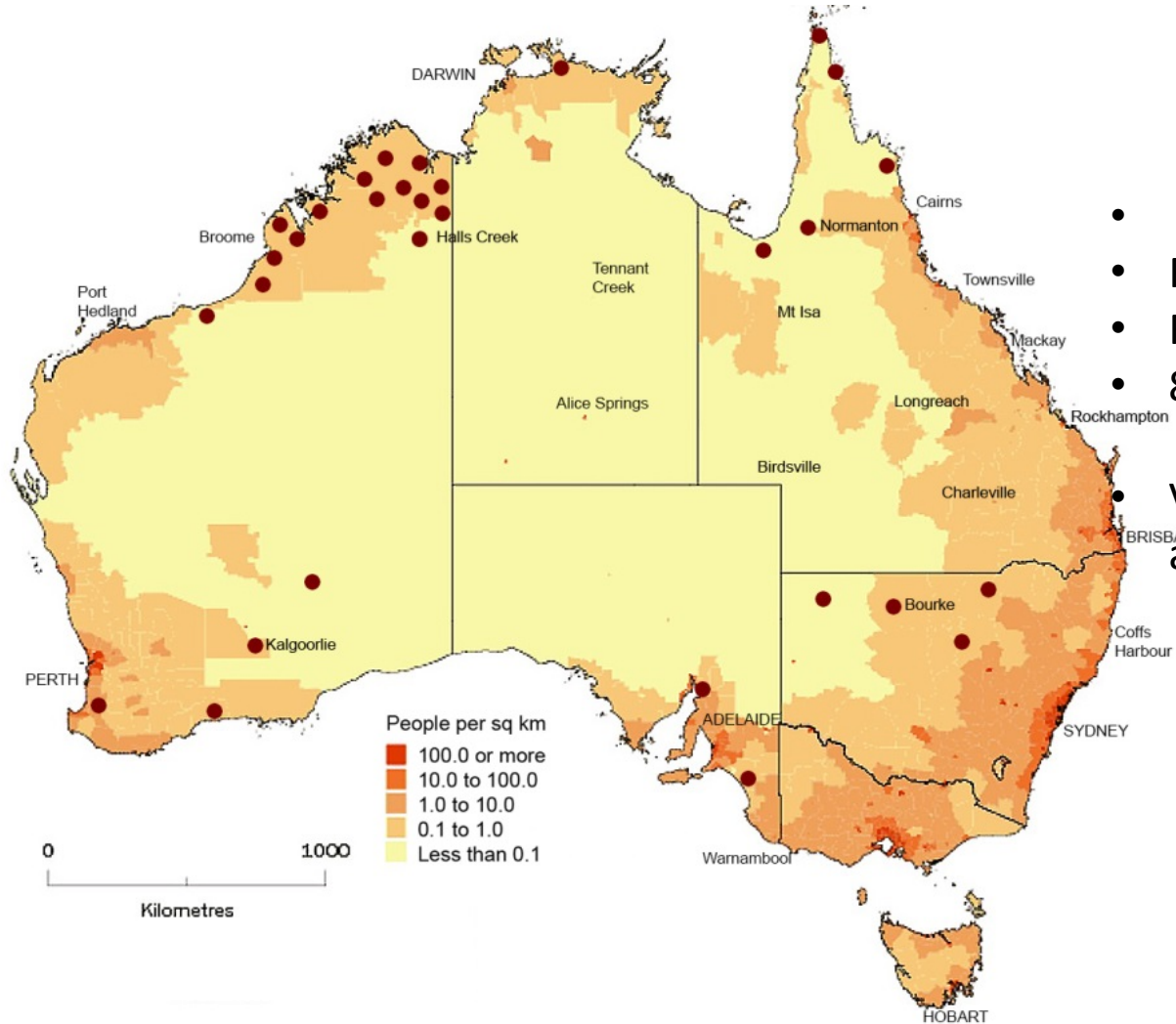
- Interviews with staff – leaders teachers, other staff
- Lesson observations
- Lesson notes/transcripts on teacher talk
- School documents
- Two levels of reporting
  - Case studies of the schools
  - Meta analysis of overall project



# The Schools

	<b>Government</b>	<b>Catholic</b>	<b>Independent</b>	<b>Total</b>
<b>WA</b>	11	3	7	21
<b>QLD</b>	5			5
<b>SA</b>	4			4
<b>NSW</b>	5			5
<b>NT</b>			1	1
<b>Total</b>	25	3	8	36

# Who is included?



- NAPLAN
- Recommendation
- Remote/very remote
- 80% Indigenous
- Variety of schools across Australia



# Case studies

## Remote Numeracy

<a href="#">Remote Numeracy</a>	<a href="#">About the Project</a>	<a href="#">Case Studies</a>	<a href="#">Publications</a>
---------------------------------	-----------------------------------	------------------------------	------------------------------

Following is a list of case studies that have been completed to date, from schools taking part in the study. They are sorted alphabetically by school. The reports will be made available on this site as they are finalised.

### Documents

- [A Supportive On-line Tool for Assessing and Planning Mathematics, Association of Independent Schools Western Australia, WA \(2.3 MB PDF File\)](#)
- [Culturally Responsive Pedagogy, Bayulu Remote Community School, WA \(5.8 MB PDF File\)](#)
- [The School with No Gates: Communication, Bourke Public School, NSW \(2.2 MB PDF File\)](#)
- [Multi-Age Classrooms and Early Career Teachers, Burketown State School, QLD \(2.2 MB PDF File\)](#)
- [Culture, curriculum and community, Coonamble Public School, NSW \(3.2 MB File\) \(3.2 MB PDF File\)](#)
- [Creating Groups for Targetted Numeracy Learning, Derby High School, WA \(4.9 MB PDF File\)](#)
- [High Expectations for Mathematics Learning, Djidi Djidi Aboriginal School, WA \(2.2 MB PDF File\)](#)
- [Catering for the Whole Child, East Kalgoorlie Primary School, WA \(2.6 MB PDF File\)](#)
- [Leadership in Mathematics Education, Halls Creek District High School, WA \(4.0 MB PDF File\)](#)
- [Structure and Support for Teachers, Kulkarriya Community School, WA \(3.5 MB PDF File\)](#)
- [Adopting a Whole School Approach, La Grange Remote Community School, WA \(3.7 MB PDF File\)](#)
- [Embracing Change in Numeracy: Adopting Current Best Practice, Leonora District High](#)



# Project Website

## Remote Numeracy

Remote Numeracy

About the Project

Case Studies

Publications



## Celebrating Success: Numeracy in remote Indigenous contexts

Australian Research Council Discovery Grant

Robyn Jorgensen

National statistics for the numeracy success of students living in remote areas of Australia are alarming. Many Indigenous students leave school functioning at very low levels of numeracy. The reasons for this are complex and often specific to particular areas. Different issues impact on particular communities or regions so a single approach to numeracy is difficult to achieve. In this educational landscape there are many success stories.

This project aims to document and celebrate these successful cases. The project will document approximately 32 cases from around Australia and across systems. It is recognised that within any context, different factors may be working including the work of teachers, leaders, community, partnership or a particular curriculum reform or indeed any combination of these.

Funded by the Australian Research Council, the study will be conducted over 3 years. Results from the study will be documented in the form of school reports and made available under the case studies tab so the successes can be shared with the immediate



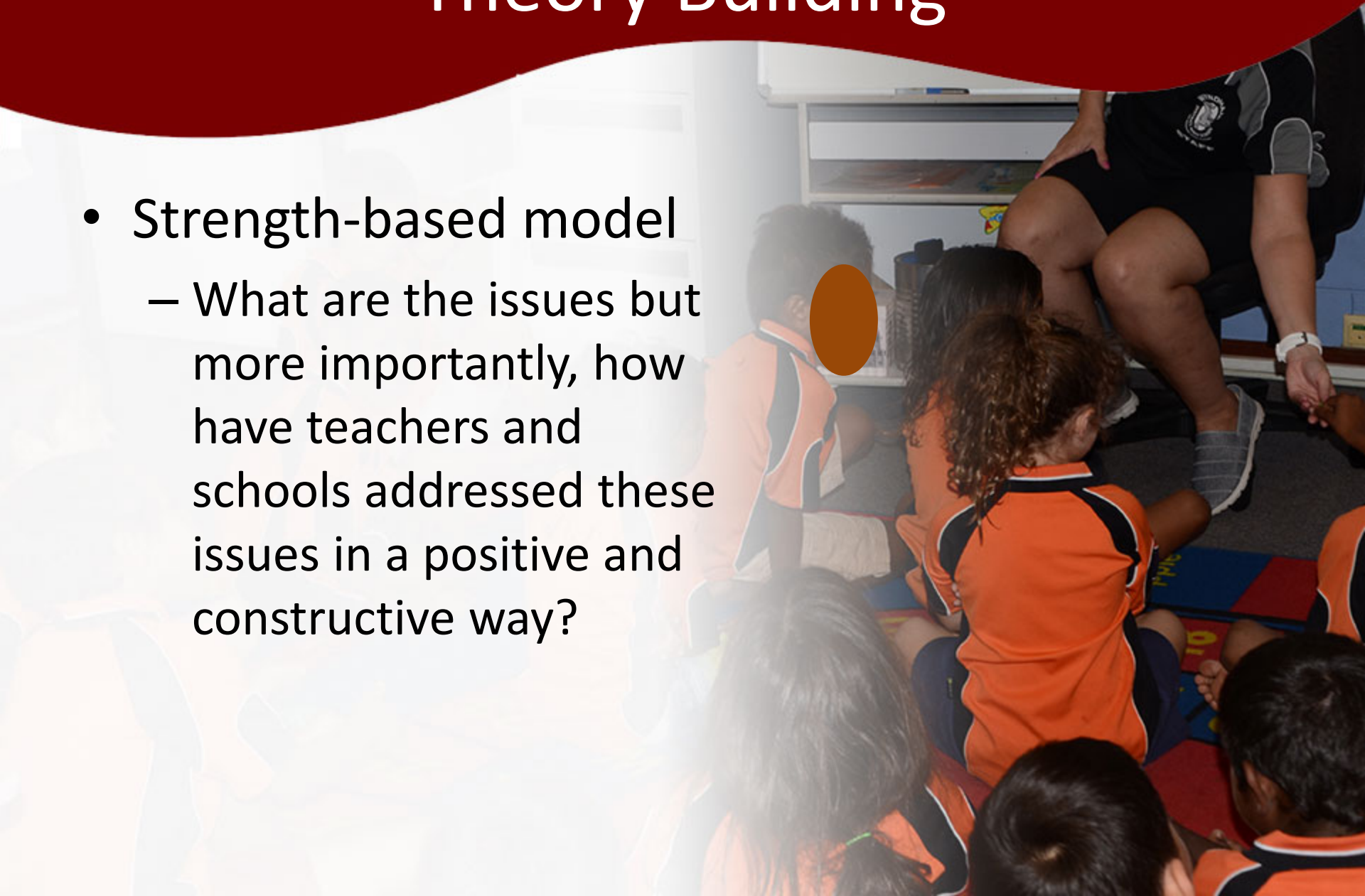
# So, what have we found....

- There are three levels of practice that need to be considered:
  - Each level interacts with the others
  - Each level needs to be addressed to build a strong learning culture at a school.
  - One-off programs are unlikely to yield sustained success – a cultural change with support is needed.



# Theory Building

- Strength-based model
  - What are the issues but more importantly, how have teachers and schools addressed these issues in a positive and constructive way?



# Theory Building

## Envisioned

Vision for the school – high expectations of all participants; common and consistent approach; Leadership (distributed), supportive culture at the school, supportive learning culture; professional learning for staff; sharing vision, embedding practice, sustainability

## Enabled

Recruiting and training of staff – teachers and support staff; databases to inform teaching and action; professional development; targeted staff to work with teachers and support staff, resources

## Enacted

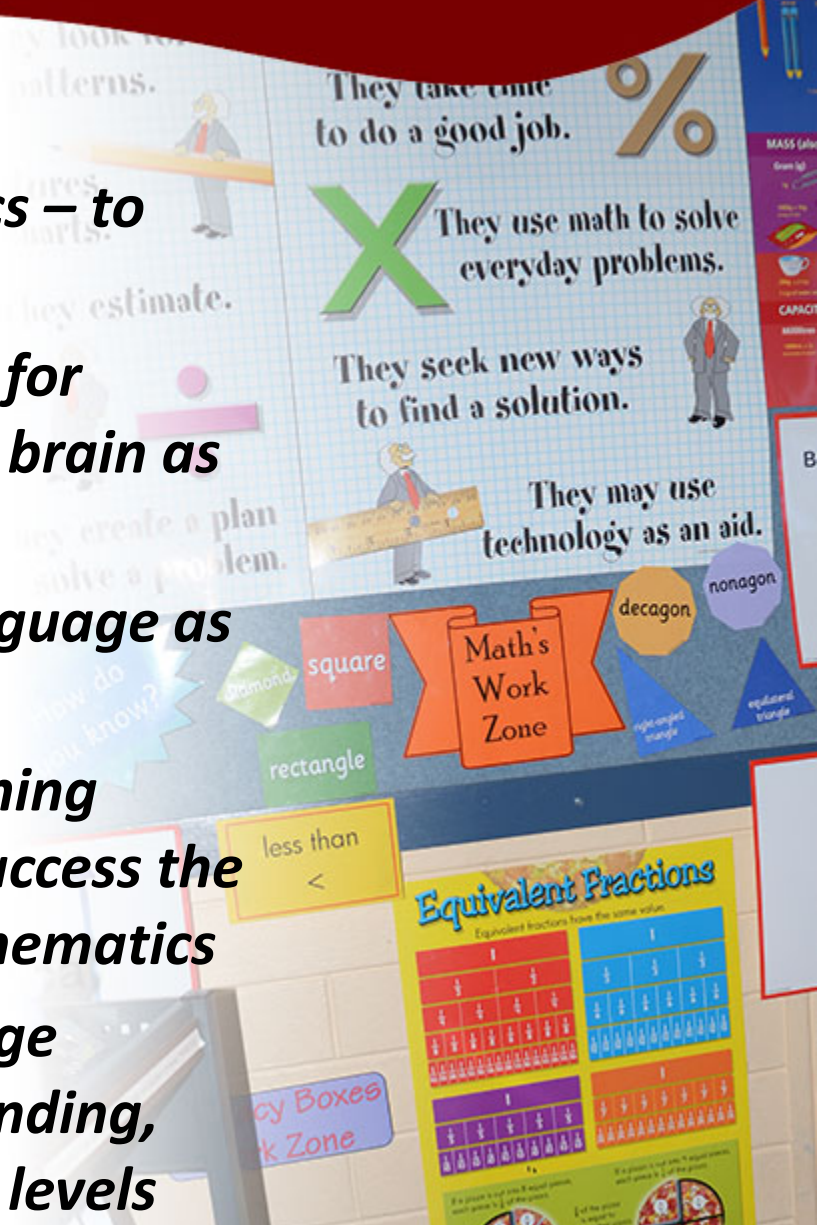
Assessment for learning; lesson structures; differentiation; scaffolding; targeted learning; language; culturally responsive pedagogy; consistency in approaches; explicit teaching of concepts and strategies; making goals explicit; pacing; small groups; whole class teaching; early years focus

## OUR LANGUAGES



# Enacted Mathematical Norms

- ***All students can learn mathematics – to high levels***
- ***Embedding mathematics is critical for understanding – embedding in the brain as well as embedding in contexts***
- ***Mathematics is as much about language as it is mathematical concepts***
- ***Transparency in learning and teaching mathematics enables students to access the “secret knowledge” of school mathematics***
- ***Mathematics lessons should engage learners at their levels of understanding, and then extend learning into new levels***



# Enabled Mathematical Norms

- ***Teacher quality is essential for quality learning***
  - *Recruitment, development, retention*
- ***Teacher support is integral to developing quality mathematical environments***
- ***A key person for mathematical support across the school enables quality teaching and environments.- numeracy coach***
- ***Aboriginal people are a key resource in teaching and the classroom.***

# Envisioned Mathematical Norms

- *Leadership is critical for developing a positive mathematics culture, supporting teachers and supporting community.*
- *Establishing a whole-school approach to teaching mathematics ensures consistency and transparency – for students, teachers, and community*





# Enacted Mathematical Norms

Practices at the level of the classroom

# *Every student can learn high levels of maths*

- *High expectations*
- *Start at “Age-level” learning*
- *Strong scaffolding*
- *Identify levels, and move forward*
- *Age-level pedagogy*



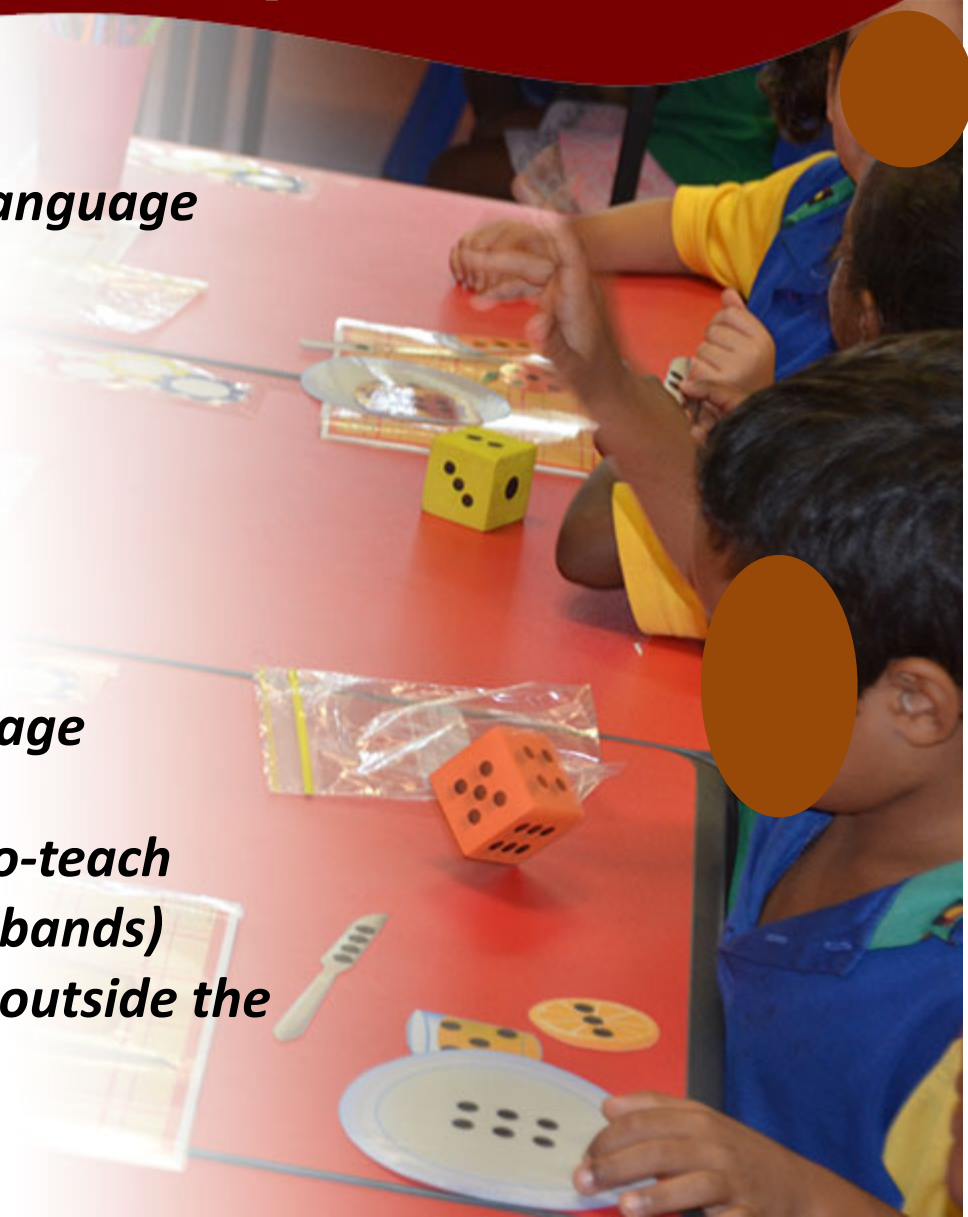
***Embedding mathematics is critical for understanding  
– embedding in the brain as well as embedding in  
contexts***

- Revision***
- Fast facts, automaticity, fluency***
- Priming for learning***
- Teaching new concepts – lesson format***
- Use of digital learning tools***
- Lesson planning/structure***
  
- Embedding mathematics in cultural and  
community experiences***
- Making maths meaningful, purposeful***
- Build potential transfer***



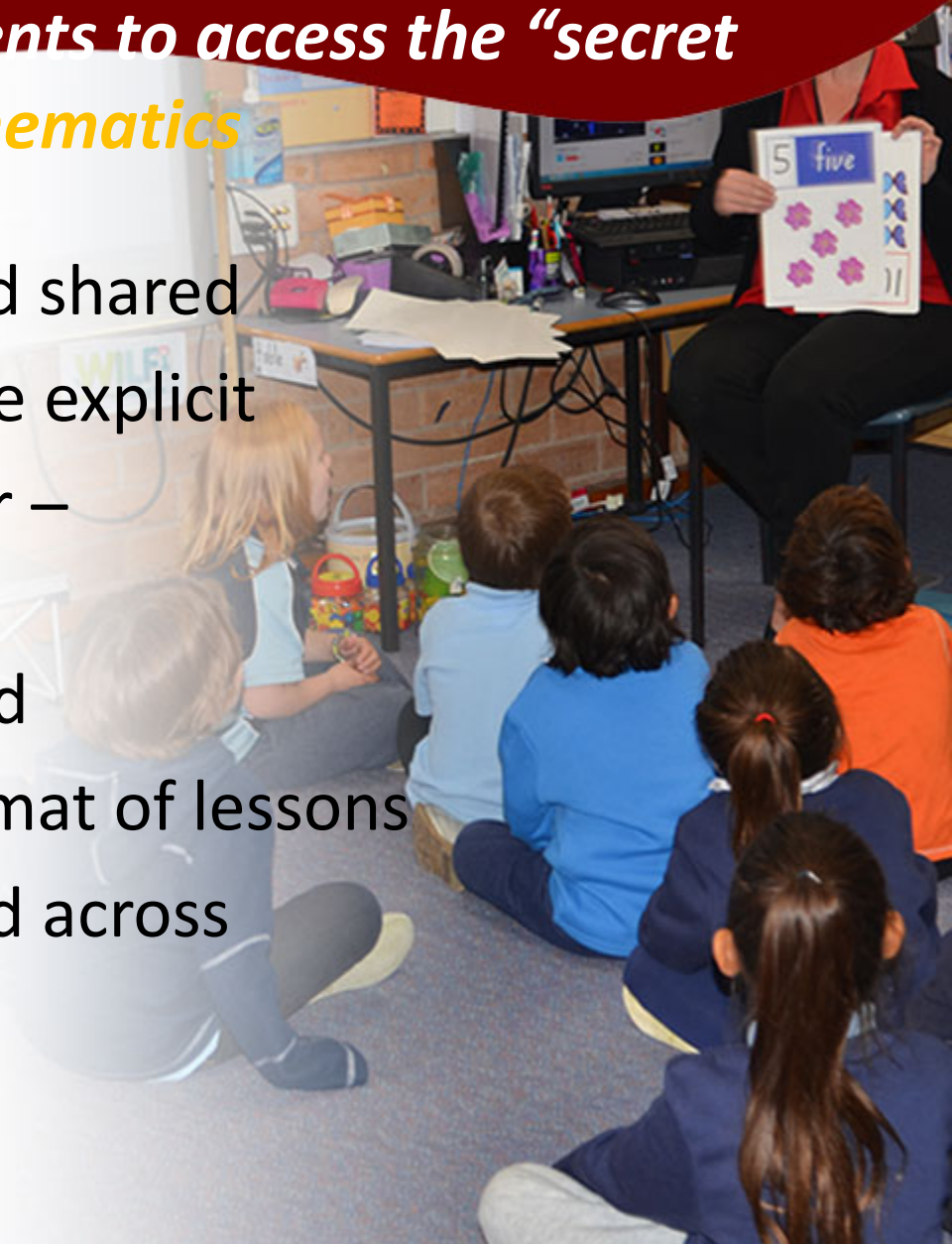
# ***Mathematics is as much about language as it is mathematical concepts***

- ***Early years have strong home language***
- ***Create resources for classroom***
  - ***Big books***
  - ***Student created books***
  - ***Posters***
  - ***Prompt sheets***
- ***Create word walls***
- ***Create dictionaries***
- ***Value and validate home language***
  - ***Home language for maths***
- ***Liaise with Aboriginal staff to co-teach***
- ***Code switching – explicit (wrist bands)***
- ***Create language environments outside the classroom***



# *Transparency in learning -teaching mathematics enables students to access the “secret knowledge” of **school mathematics***

- Learning intent stated and shared
- Learning behaviours made explicit
- Expectations of behaviour – mathematical and social
- Learning ladders displayed
- Being clear about the format of lessons
- Consistency over time and across lessons



# *Mathematics lessons should engage learners at their levels of understanding, and then extend learning into new levels*

- Assessment for learning
- Data walls
- Scaffolding appropriately
- Strong mathematical knowledge from teacher
- Differentiation – without shaming
- Targeted learning
- Grouping
  - by attendance and behaviour
  - Mixed grouping



# Project website

© Robyn.jorgensen@canberra.edu.au

[http://www.canberra.edu.au/  
research/faculty-research-  
centres/stem-education-  
research-centre/research-  
projects/remote-numeracy](http://www.canberra.edu.au/research/faculty-research-centres/stem-education-research-centre/research-projects/remote-numeracy)



- Any questions?







THE MATHEMATICAL  
ASSOCIATION OF VICTORIA

Learn more at  
[www.mav.vic.edu.au](http://www.mav.vic.edu.au)

## COMMUNICATION

- > Website and publications
- > Matrix newsletter
- > Advocacy
- > News page
- > Public events



## PUBLICATIONS

- > Prime Number  
(Primary journal)
- > Vinculum  
(Secondary journal)
- > Common Denominator  
(Magazine)



## PROFESSIONAL LEARNING

- > Contracted in-school
- > Network days
- > VCE
- > Professional learning events
- > Virtual learning sessions



# THE MATHEMATICAL ASSOCIATION OF VICTORIA



## MEMBERSHIP

- > Become a member
- > Mathematics Active Schools

## CONFERENCES

- > Annual conference
- > Primary conference



## RESOURCES

- > MAVshop
- > Teaching resources
- > Professional resources
- > VCE trial exams, SACs,  
VCE solutions



## STUDENT ACTIVITIES

- > Maths Talent Quest
- > STEM events
- > Maths camp
- > Games days
- > Family maths activities
- > VCE revision lectures
- > Made by Maths app



# Other data





Date	Description	Amount
10/01	Salaries	1000
10/02	Wages	500
10/03	Expenses	200
10/04	Interest	100
10/05	Dividends	150
10/06	Depreciation	300
10/07	Provision for tax	250
10/08	Transfer to reserves	400
10/09	Transfer to P&L	100
10/10	Transfer to Retained Earnings	100
10/11	Transfer to Dividends Payable	150
10/12	Transfer to Dividends Received	150
10/13	Transfer to Dividends Payable	150
10/14	Transfer to Dividends Received	150
10/15	Transfer to Dividends Payable	150
10/16	Transfer to Dividends Received	150
10/17	Transfer to Dividends Payable	150
10/18	Transfer to Dividends Received	150
10/19	Transfer to Dividends Payable	150
10/20	Transfer to Dividends Received	150
10/21	Transfer to Dividends Payable	150
10/22	Transfer to Dividends Received	150
10/23	Transfer to Dividends Payable	150
10/24	Transfer to Dividends Received	150
10/25	Transfer to Dividends Payable	150
10/26	Transfer to Dividends Received	150
10/27	Transfer to Dividends Payable	150
10/28	Transfer to Dividends Received	150
10/29	Transfer to Dividends Payable	150
10/30	Transfer to Dividends Received	150
10/31	Transfer to Dividends Payable	150