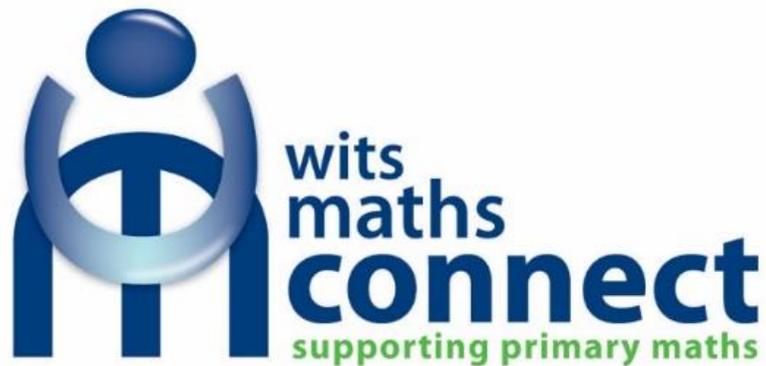


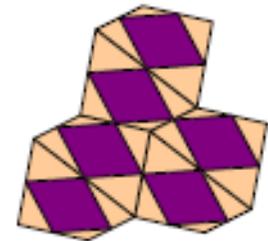
# Symposium

Challenges of and opportunities  
for reform in numeracy and  
early algebra education



## The Ukuqonda Institute

Dedicated to the promotion  
of excellence in  
mathematics and physical  
science education.



# **Symposium**

Challenges of and opportunities  
for reform in numeracy and  
early algebra education

**Shortcomings of Mathematics Education Reform in  
The Netherlands: A Paradigm Case?**

Koeno Gravemeijer, Geeke Bruin-Muurling, Jean-Marie Kraemer & Irene van  
Stiphout

# Shortcomings of Mathematics Education Reform in The Netherlands: A Paradigm Case?

Dutch students' proficiency fell short of what might be expected of reform in mathematics education aiming at conceptual understanding

.. disappointing results appeared to be caused by a deviation from the original intentions of the reform, resulting from the textbooks' focus on individual tasks

..... It is suggested that this “task propensity”, together with a lack of attention for more advanced conceptual mathematical goals, constitutes a general barrier for mathematics education reform

.... It is argued that to foster successful reform, a conscious effort is needed to counteract task propensity and promote more advanced conceptual mathematical understandings as curriculum goals.

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<b>Today</b>			
We are here now			
Koeno Gravemeijer			
A Tensions	B Goals	C Support	D Options
Tea			
Alwyn Olivier			
A	B	C	D
Lunch			
Hamsa Venkat			
Tea			

<b>Tomorrow</b>			
Paul Cobb			
Tensions	Goals	Options	Support
Tea			
Group reports A and B			
Lunch			
Group reports C and D			
Satsope Maoto			
Tea			
Plenary panel			

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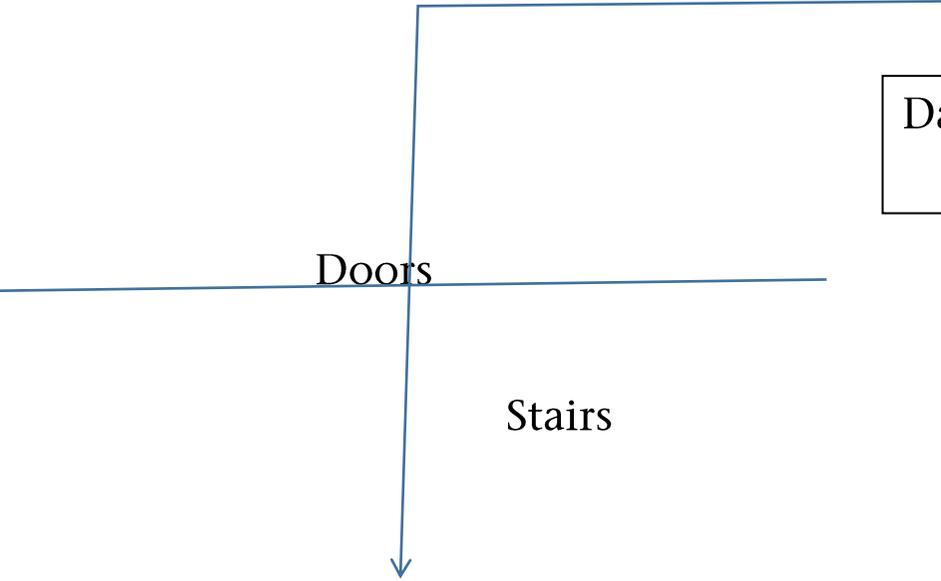
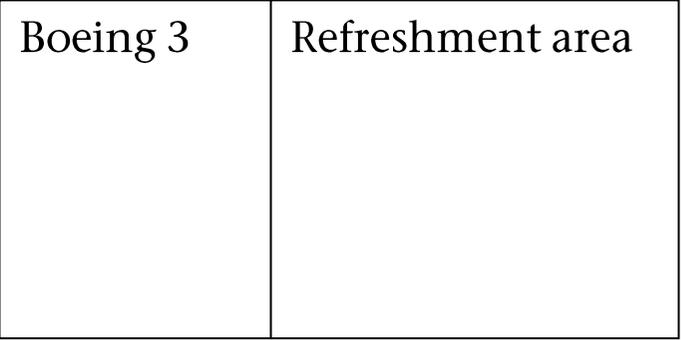
<p>Group A in Harvard room Chair: Prof Karin Brodie</p> <p><i>Task propensity and other deviations from reform plans</i></p>	<p>Group B in Dakota room Chair: Dr Lynn Bowie</p> <p><i>“Curriculum goals envisioned by reform agendas”</i></p> <p><i>Advanced conceptual mathematical understandings</i></p> <p><i>Ambitious teaching</i></p>
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<p>Group C in Boeing 2 front Chair: Ms Jansie Niehaus</p> <p><i>Teacher support and development strategies for ambitious teaching</i></p>	<p>Group D in Boeing 2 back Chair: Prof Mike Askew</p> <p><i>“Variations in reform initiatives”</i></p> <p><i>Modest reform options</i></p> <p><i>Implementing reform</i></p>
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Please make a provisional choice of the group you wish to join.

Write your choice A, B, C or D on a note, and your name.

Pass to the end of the row for collection.



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Three hundred and sixty four

Three hundred and sixty four

300604

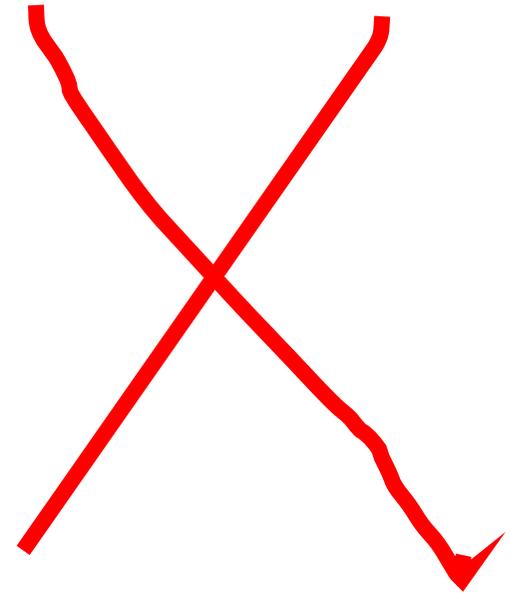
Three hundred and sixty four

300604

How may the teacher respond?

Three hundred and sixty four

300604



Three hundred and sixty four

300604

Do you mean 300 and 60 and 4?

Three hundred and sixty four

300604

Do you mean 300 and 60 and 4?

Can we write

$$300 + 60 + 4?$$

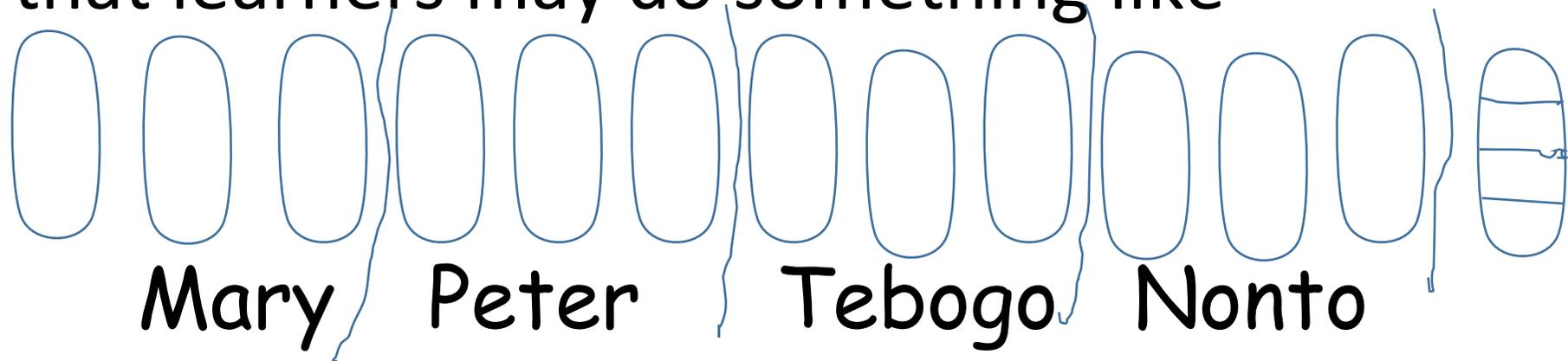
A task suggested by the Grade 3 CAPS curriculum:

Share 13 chocolates between 4 children

Show your work

# Share 13 chocolates between 4 children

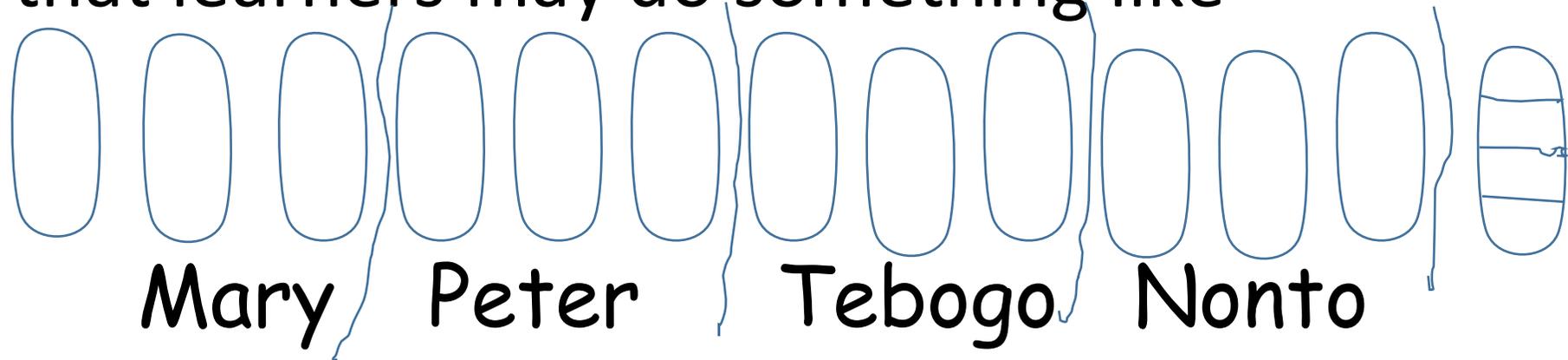
The reform based instructional expectation is that learners may do something like



Each get 3 chocolates and a piece

# Share 13 chocolates between 4 children

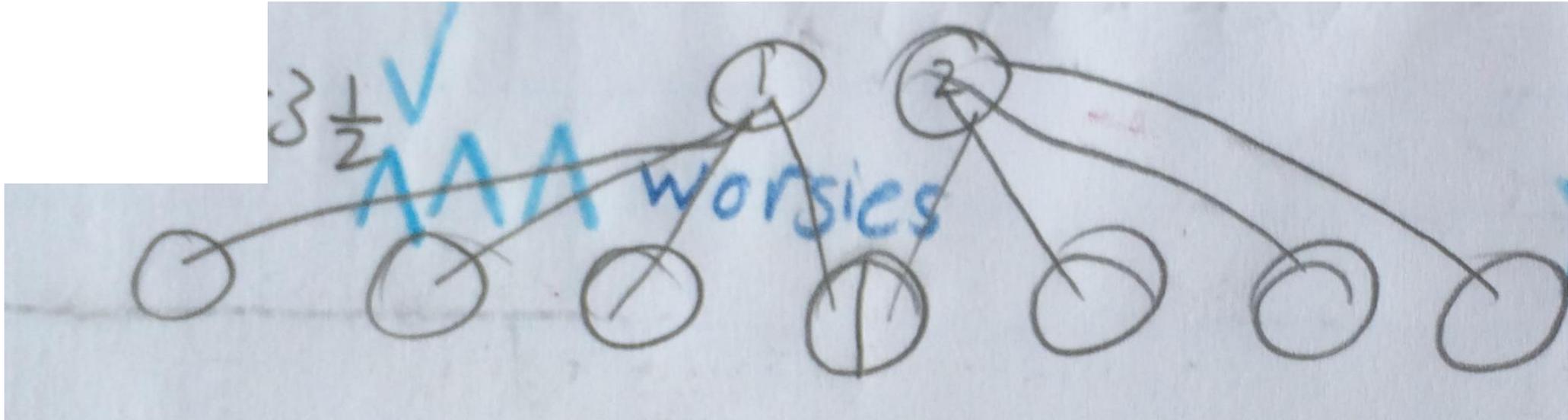
The reform based instructional expectation is that learners may do something like



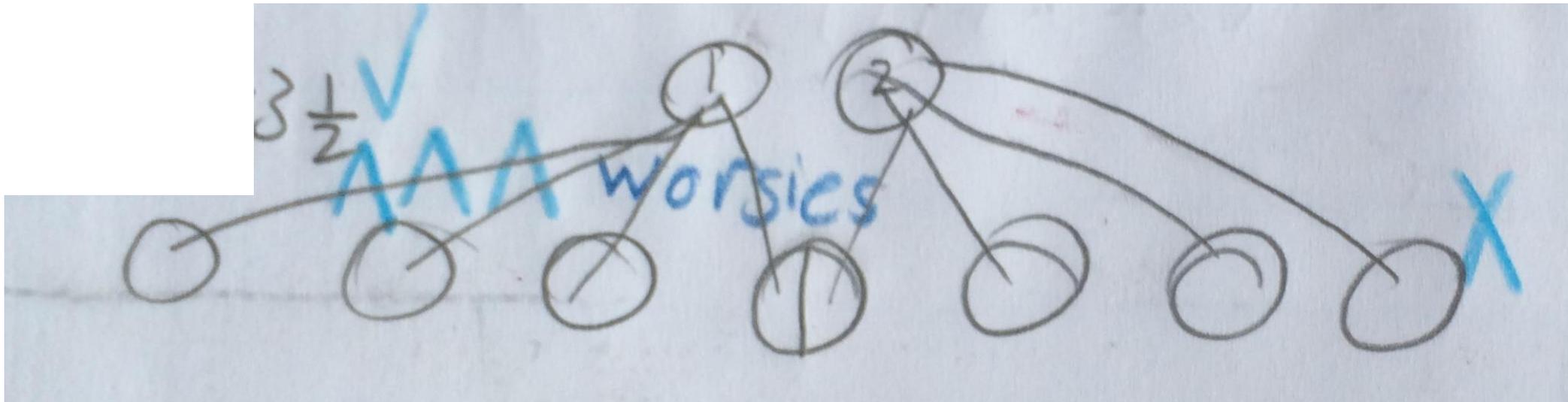
Each get 3 chocolates and a piece

And the notion of “a piece” may be refined, with input by the teacher, to “a quarter”

How can 7 sausages be fairly shared between two people?



The teachers' response:



# The teachers' response:

Huiswerk. WEEK 6 (14 Mei - 18 Mei) DOEN alles op die blaas!

Maandag:

1. Deel 7 worsies gelykop tussen 2 maats. (Wys jou som)

$7 \div 2 = 3\frac{1}{2}$  ✓  
worsies

$7 - 2 = 3$   
 $6 - 2 = 4$   
 $3 - \frac{1}{2} = 3\frac{1}{2}$  worsies

$3\frac{1}{2}$  X

2. Verdeel 9 pizzas tussen my en 2 maats. (Wys jou som)

$9 \div 3 = 3$  ✓  
worsies

$9 + 3$   
 $6 - 3 = 3$   
 $3 - 3 = 0$   
 $2 + 1 = 3$  PIZZAS

Dinsdag:

Two car rental firms advertise as follows:

**Axis cars are cheapest!**

*Only R180 per day plus R2 per kilometre, for a clean luxurious car.*

*Contact our agents at 011-7536722.*

*Please book early to avoid disappointment.*

**Drive a Hearts car soon.**

R3 per kilometre plus R120 per day.

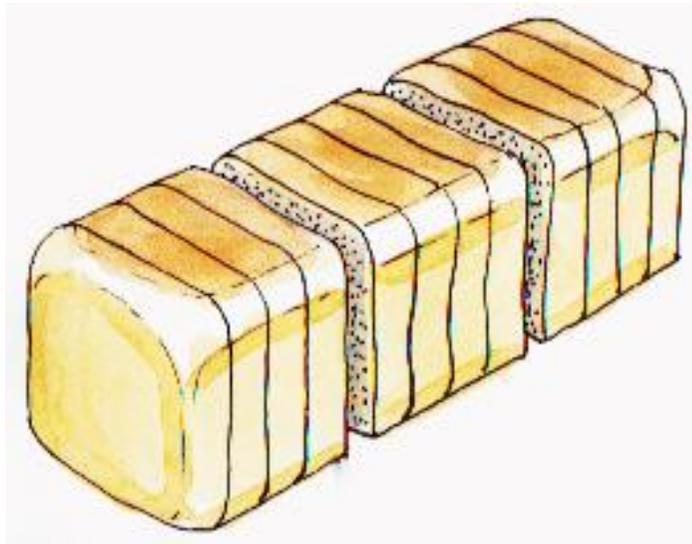
Available at all airports and stations.

Watch for our signs.

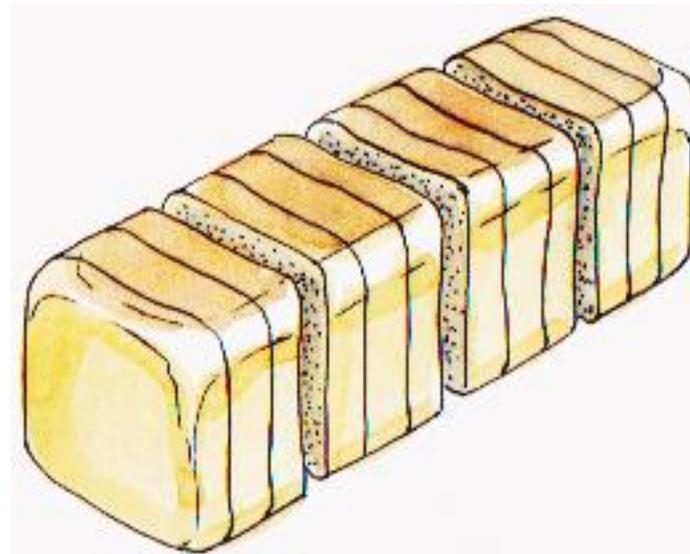
What advice would you give to a friend flying to Durban, and plans to rent a car for one day?

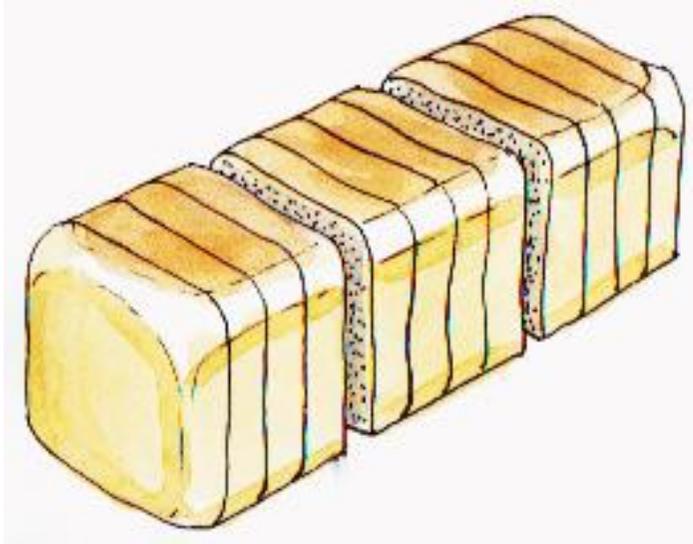
In what kind of part is each loaf divided?

A



B



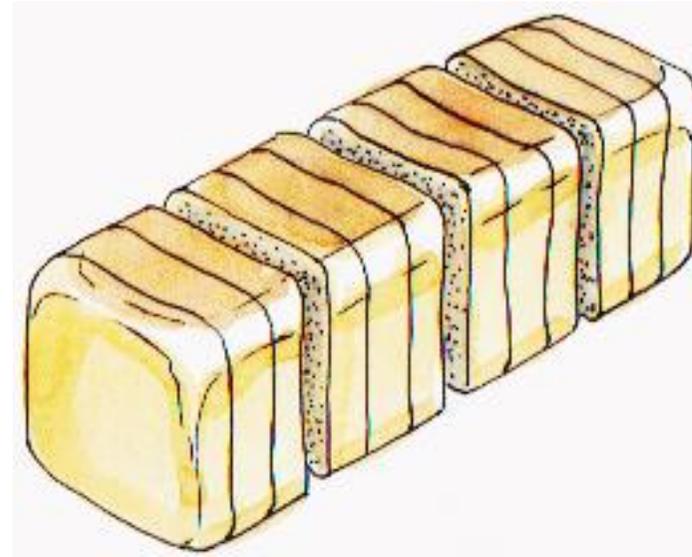


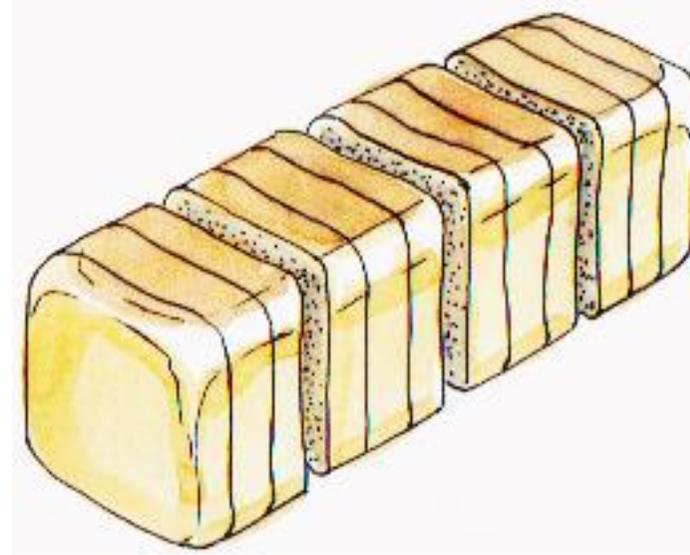
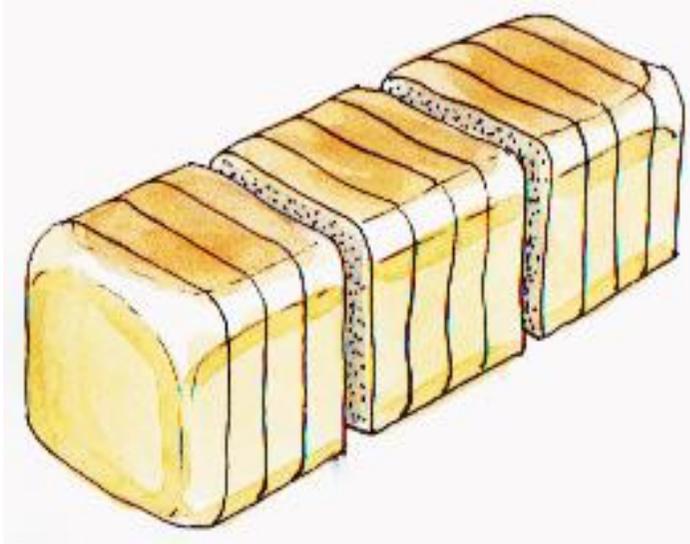
Lesego says this loaf is divided into quarters, but Tebogo says it is divided into twelfths.

How can you help them to reach agreement?

Do you think Lesego and Tebogo will have different opinions about this loaf too?

How can you help them?





How much bread is a third of a loaf  
and a quarter of a loaf together?

"7 slices"

"7 twelfths"

What part of a  
loaf is each  
slice?

1 third can also be  
describe as 4  
twelfths



Learner production  
in response to a



Articulation  
Refinement  
Justification



Consolidation  
and extension

challenging  
situation