

# ASSESSMENT IN MATHEMATICS IN MULTICULTURAL CONTEXTS

<https://inclusme-project.eu/>

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*Josette Farrugia & Michiel Doorman*

*Workshop*

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# Aims

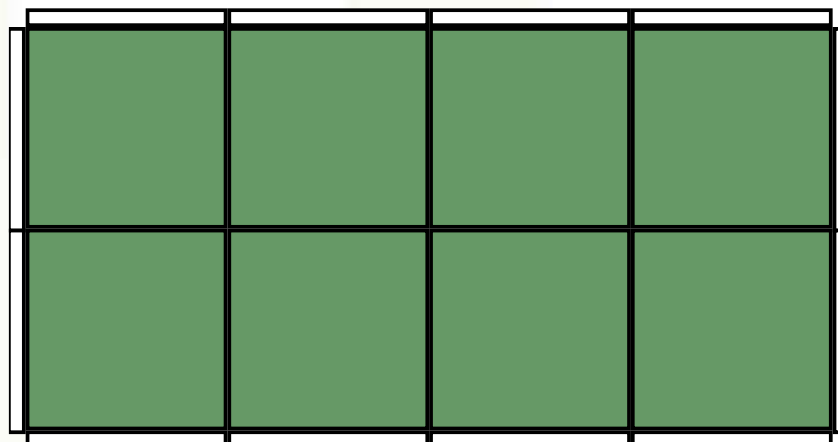
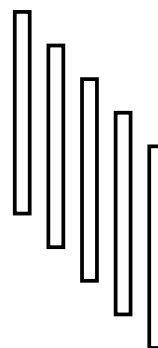
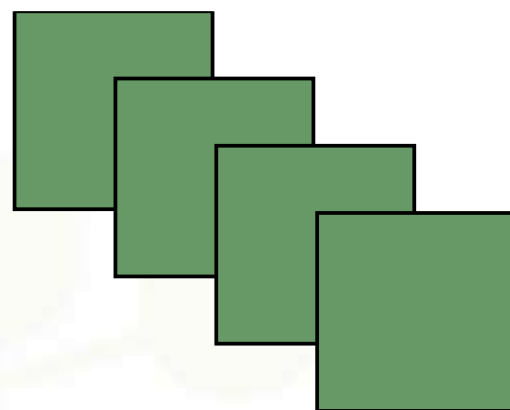
- Explore the meaning of 'fairness' in assessment.
- Consider assessment strategies/tools that take into account students' diversity.

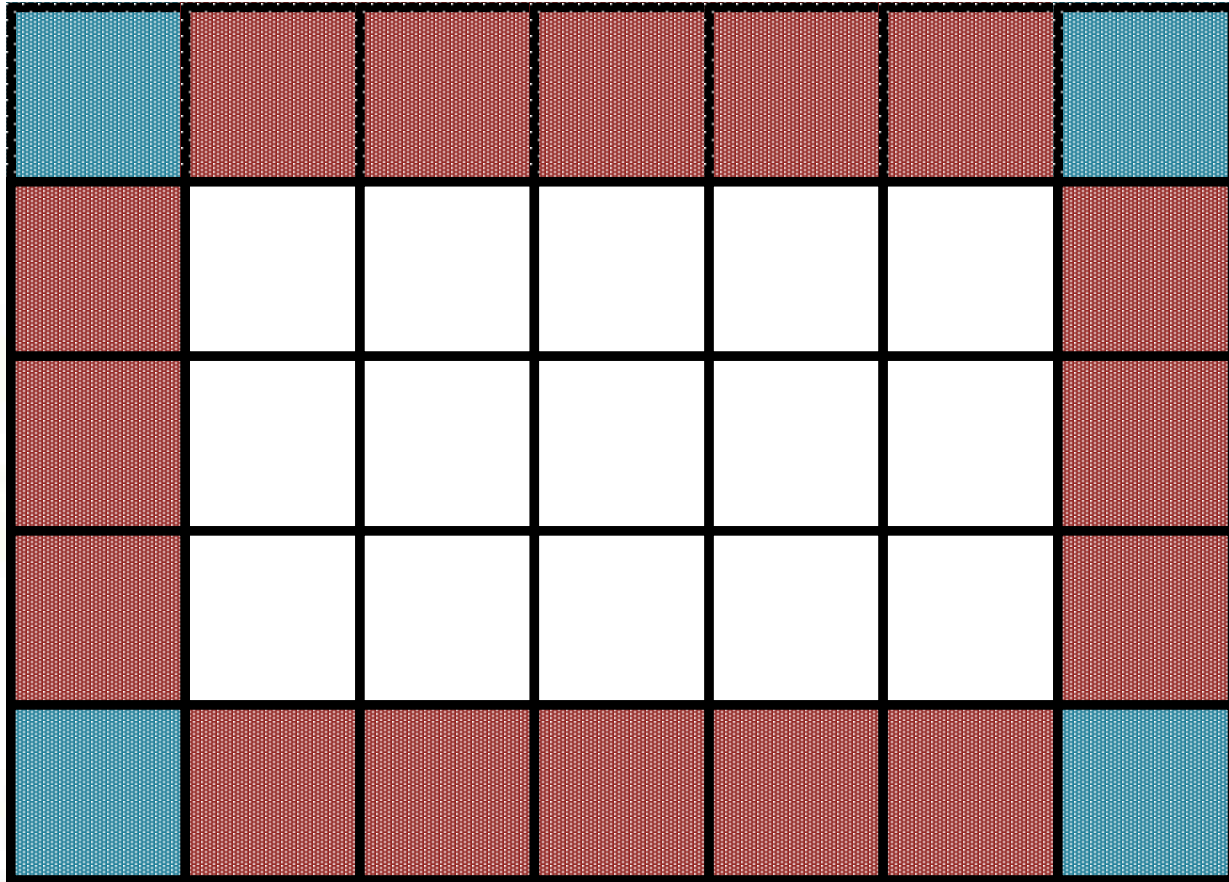


# The Isis problem

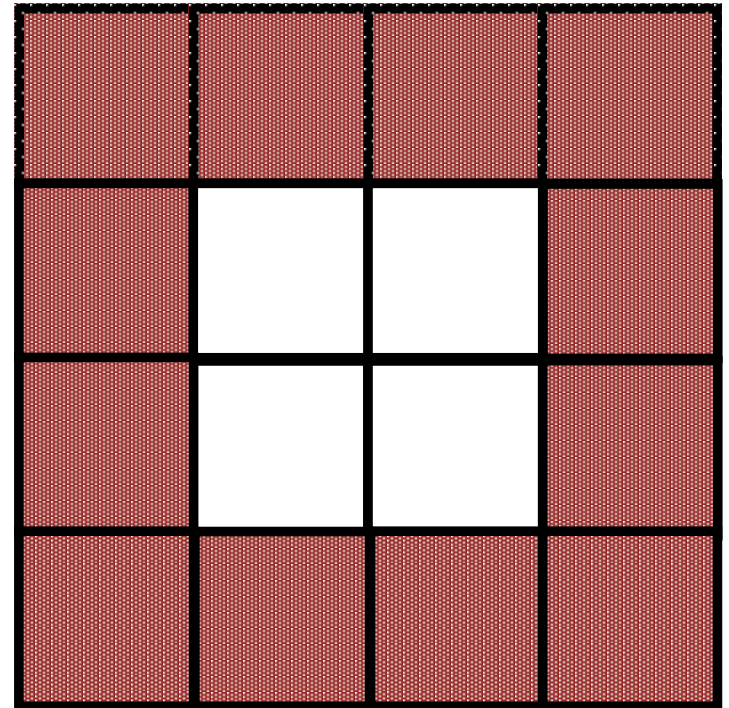
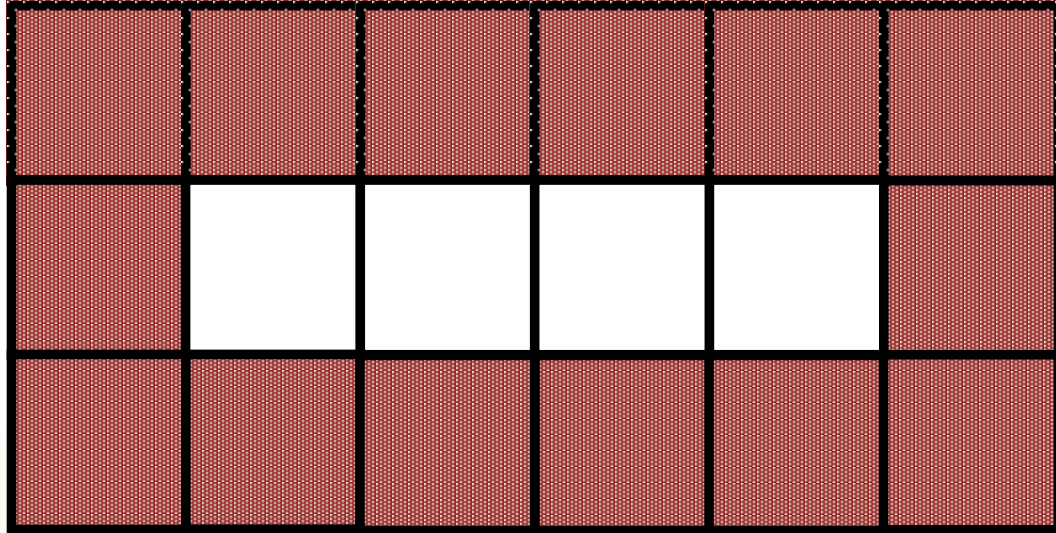
- Given: rectangles with whole numbers as lengths of sides. Is it possible to have equal area and perimeter?



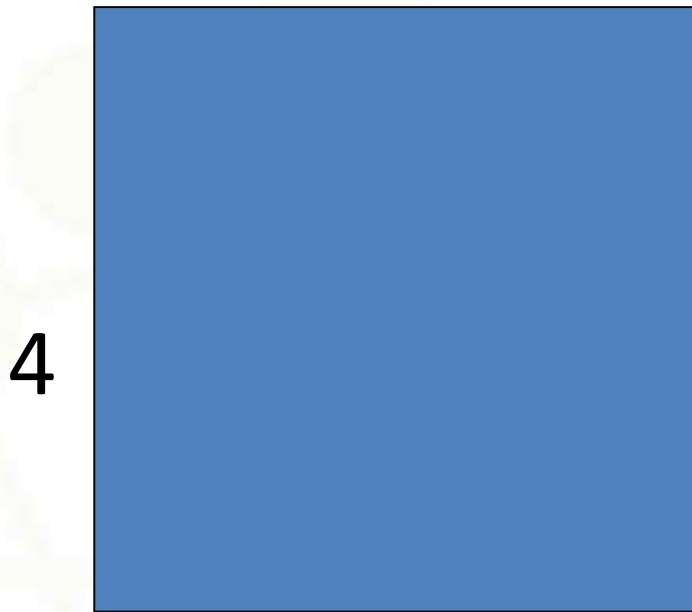




# “Tiled perimeter”



# The Isis problem

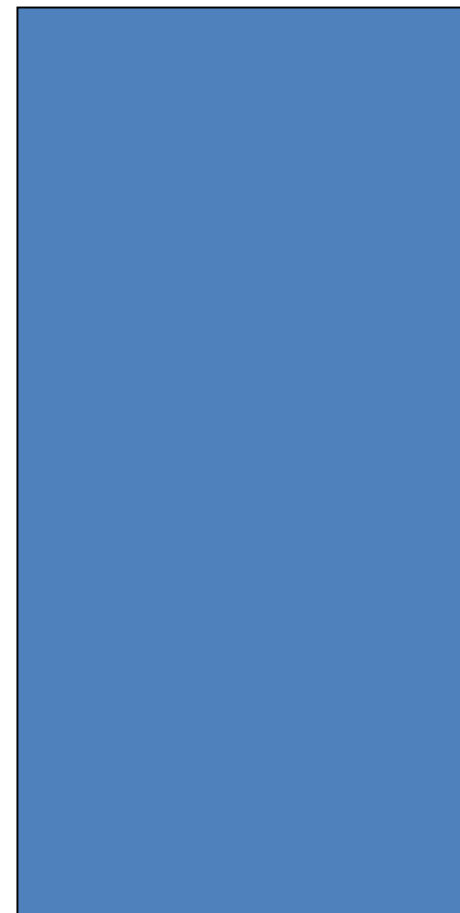


4

Perimeter: 16

Area: 16

6



3

Perimeter: 18

Area: 18



## Discussion

- **How did you feel during this exercise? Why?**
- **What does it tell us about classroom assessment?**
- **What kind of experiences of assessment do we have? Why?**

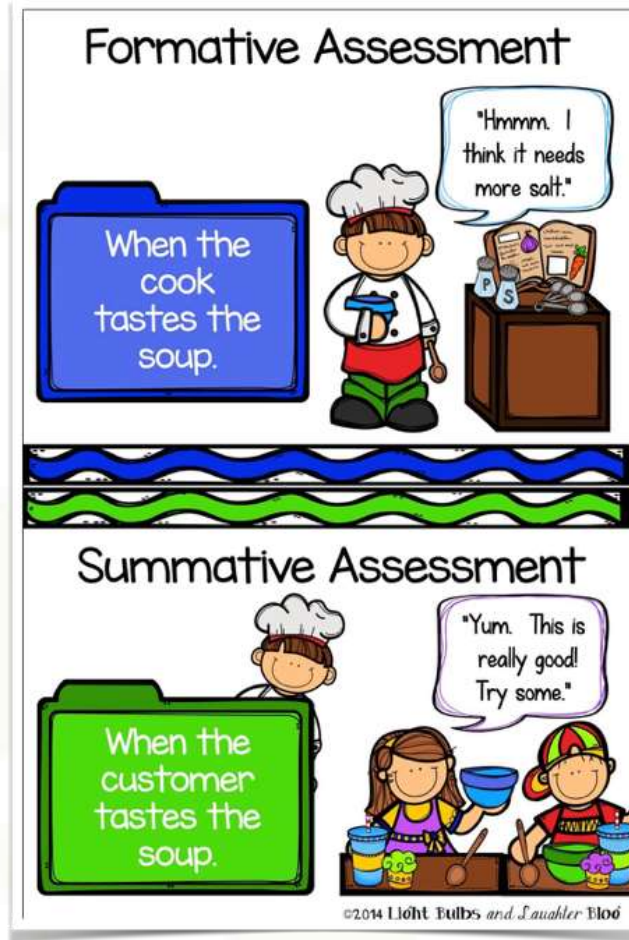


# Statements about assessment

1. Assessment encourages reproduction
2. Assessments stigmatize (“I am good in mathematics”)
3. Students learn little from feedback as soon as they have their grades
4. Assessment is mainly used to collect grades, and little attention is paid to:
  - Identify learning gaps,
  - Show learning potential,
  - Give feedback,
  - Adapt teaching to the results

- What if we focus more on assessment as part of learning?
- How can assessment support learning, rather than serving to check how much learning has taken place?

# Formative and Summative Assessment



# Formative Assessment

Formal and informal processes teachers and students use to gather evidence for the purpose of improving learning.

Key features (Wiliam, 2011):

- Where the learner is going
- Where the learner is
- How to get there



## Formative assessment involves

Activities to collect information for improving learning processes:

Students can receive constructive feedback

Students become aware of learning goals

Students get involved in their learning process



## Formative and Summative

A teacher designs a unit on shapes. The teacher gives the students a quiz and collects the papers.

Instead of grading the papers, she reads through them carefully, and on the basis of what she discovers about what the class has and has not learned, she plans appropriate remedial activities for the next lessons.



## Formative and Summative

A mathematics teacher finalizes the topic on algebra. At the end of the topic, the teacher gives the students a test. The teacher marks the test and the students get their grades.

The teacher also includes comments on each of the tests, telling the students what they had done wrong and what they needed to do to obtain the correct answer.



## Formative and Summative

A mathematics teacher is teaching the students about graph sketching. She asks the students to draw a graph of

$$y = \frac{1}{1+x^2}$$

Each student sketches the graph on a mini whiteboard and holds it up for the teacher to see. The teacher sees that the class has understood how to sketch the graph and moves on with the next lesson.



## Fairness...

Assessment practices can have an important impact on the lives of students.

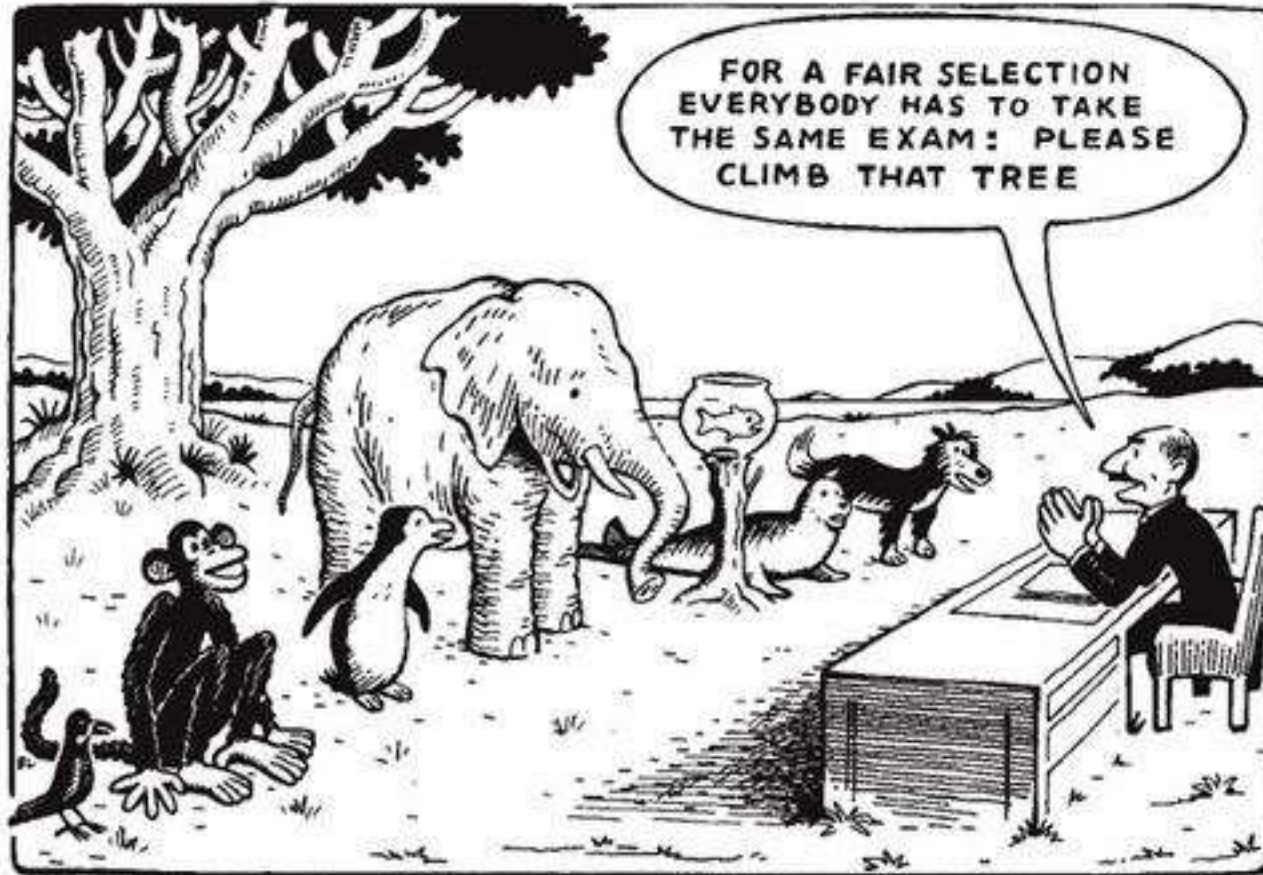
Therefore as teachers we need to ensure 'fairer' assessment practices.

**What does fairness mean?**

**Can fairness be achieved by treating everyone in the same way?**



## Is this fair?



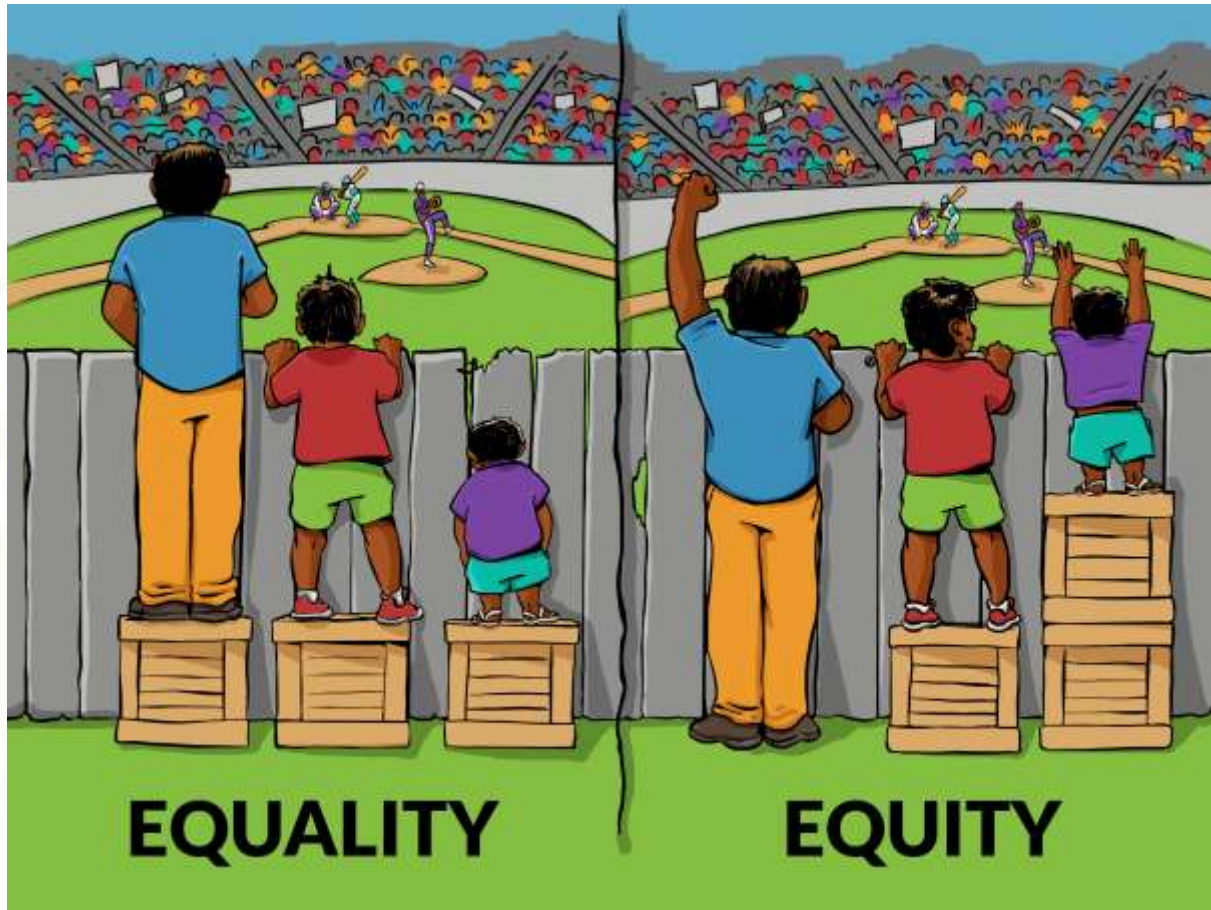
# Diversity

**How diverse are your classes?**

**What kinds of diversity do you observe?**



# Equality vs Equity...



## Equality or Equity...

**Equality** aims to ensure that everyone gets the same things in order to be able to achieve their full potential in assessment.

**Equity** means ensuring that everyone has access to the resources and opportunities that they need to achieve their full potential in education.



## Framework to support 'fairer' assessment

As teachers we need to re-examine our assessment practices.

We need to think about individual students so that in our mathematics classrooms every student can learn, and our assessment can lead towards learning.



Formative assessment will be especially important in classes with a range of achievement levels, backgrounds, cultures, language proficiency ...



# Diversity responsive assessment...

- is mindful of student differences and employs assessment methods appropriate for different student groups
- requires students' involvement at every step in the assessment process and builds upon their lived experience  
(Montenegro and Jankowski, 2017)



## Diversity and culturally responsive assessment practices

- Emphasizing prior knowledge of different groups
  - Building on cultural knowledge
  - Developing a supportive relationship with students
  - Recognizing that students can belong to more than one group
  - Making use of code-switching
  - Using a range of modes and tasks
- (Klenowski, 2009)



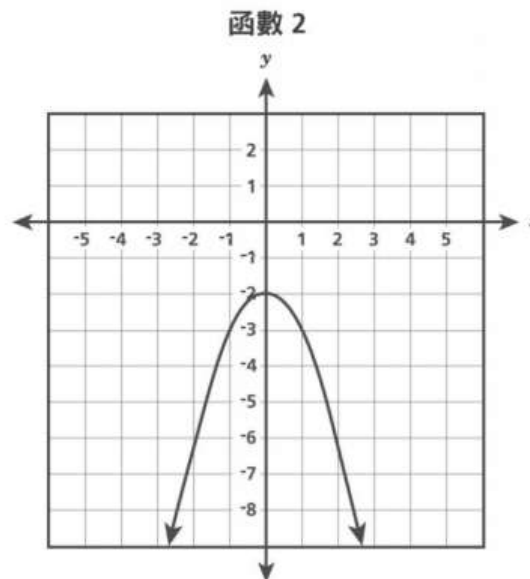
## Examinations are considered to be fair because...

- They are considered to be neutral and value-free
- They are perceived as being able to assess basic abilities
- They judge ability based on merit
- Since they are administered to large groups they can establish standards (Stobart, 2005)
- **What do you think?**



## Answer a question

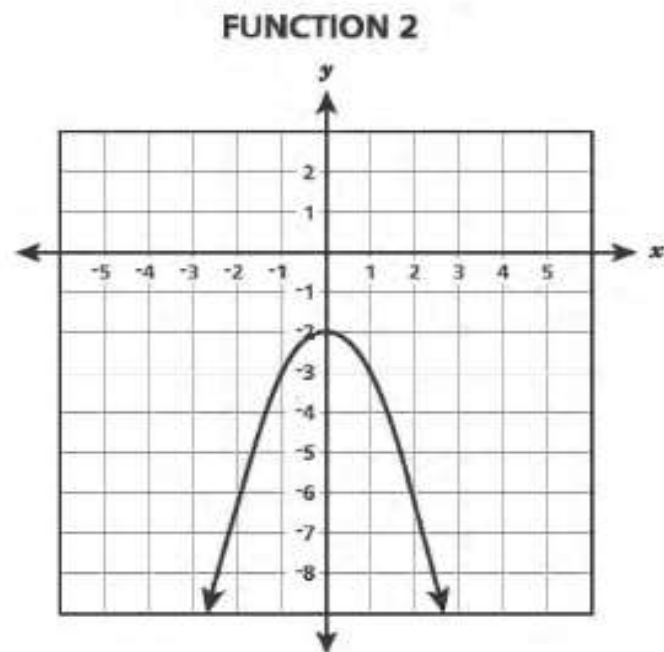
21 函數 1 由方程式  $y = -\frac{4}{5}x - 2$  表示，函數 2 則用下圖表示。



請問哪個函數的所有輸出值均小於  $-1$ ?

- A 這兩個函數都是
- B 僅函數 1
- C 僅函數 2
- D 這兩個函數都不是

- 21 Function 1 is represented by the equation  $y = -\frac{4}{5}x - 2$ , and function 2 is represented by the graph below.



For which of the functions are all the output values less than  $-1$ ?

- A both functions
- B only function 1
- C only function 2
- D neither function

# Tasks

- Are the contexts and tasks fair for ALL students
  - in raising interest, providing meaningful starting points, preventing information overload, ...
  - regarding different backgrounds (gender, culture, language abilities, ...)
- How can they be improved?
- What does this tell you about fairness of your own assessment practices?



## Take home message

- A one-size-fits-all assessment system is not in the best interest of the students (Elwood & Lundy, 2010).
  - Formative assessment can help us improve learning of all our students.
- We need to acknowledge that learning and assessment are not neutral but they are embedded within the social and cultural experiences of our students (Elwood & Murphy, 2015).
  - Awareness of this will help us be more sensitive towards fairness issues in assessment.



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