

# Coherencia en la enseñanza de matemáticas

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# Pregunta de investigación

¿Cuál es la relación entre  
currículo y logro? ó  
¿Cuál es el rol de la  
coherencia?

# **Descripción del enfoque metodológico; análisis documental**

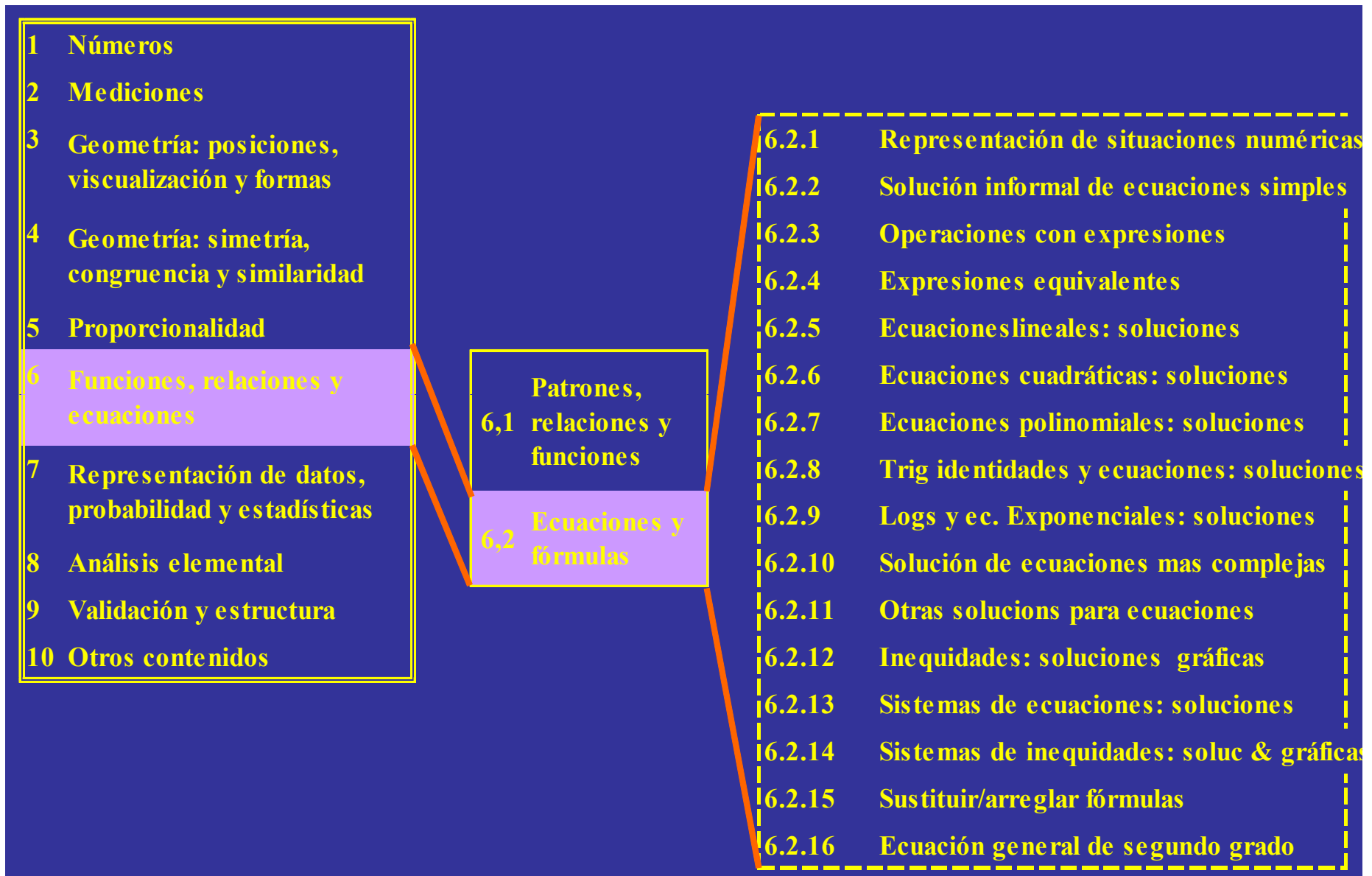
# Modelo Curricular tripartita de la IEA

*Currículo logrado:  
conocimientos,  
competencias y actitudes  
obtenidos por los  
estudiantes*

*Currículo aplicado: objetivos, estrategias y prácticas  
implementadas en el salón de clase.*

*Currículo prescrito: políticas, programas y objetivos generales  
del sistema educativo*

# Marco TIMSS de Matemáticas – Un ejemplo



# Dos “mapas de seguimiento de tópicos”



# Ejemplos del Índice IGP

| <b>Código</b> | <b>Descripción</b>                           | <b>Índice IGP</b> |
|---------------|--|-------------------|
| 1111          | Números enteros: significado                 | 1,8               |
| 1122          | Fracciones decimales                         | 4,6               |
| 1141          | Aritmética binaria &/o base de otros números | 6,6               |
| 1143          | Números complejos y sus propiedades          | 10,7              |
| 141           | Transformaciones geométricas                 | 7,1               |
| 151           | Conceptos de proporcionalidad                | 6,4               |
| 161           | Patrones, relaciones & funciones             | 9,0               |
| 162           | Ecuaciones & fórmulas                        | 7,0               |
| 171           | Representación de datos & análisis           | 7,4               |
| 172           | Incertidumbre y probabilidad                 | 9,7               |
| 181           | Elementary Analysis: Procesos infinitos      | 11,5              |

# Constructos de contenido instruccional

## ❖ **Coherencia curricular**

- **Estructura curricular**

## ❖ **Foco curricular**

- **Tiempo de exposición (OTL)**

## ❖ **Rigor curricular**

- **Nivel de complejidad cognitiva**



# Definición de coherencia

Los contenidos estándar, en el agregado, son **coherentes** si están **articulados en el tiempo**, como una secuencia de tópicos y desempeños **consistentes con la lógica de contenido de la disciplina de la cual se deriva el tema** de estudio, y de su naturaleza jerárquica. Esto **no implica una única secuencia coherente**; sólo que la secuencia refleje la estructura inherente de la disciplina.

# Definición de coherencia

En otras palabras, hay coherencia si la secuencia de tópicos a través de los grados escolares es consistente con la estructura lógica de las matemáticas. Si los pre-requisitos se cubren antes de los tópicos avanzados.

# Matemáticas son acumulativas

- Bien hechos, los tópicos en cada año dependen de los tópicos cubiertos en años anteriores.
- Cuando no se tiene en cuenta su naturaleza acumulativa, el estudio de las matemáticas degenera en una lista de cosas por hacer, sin significado, y de memorización de hechos desconectados entre sí, lo que afecta especialmente a los estudiantes más débiles.

*James Milgram, Professor of Mathematics, Stanford University  
MSU Education Policy Forum, Washington, DC, June, 2003*


# Currículo de matemáticas de países con mayor logro

| Topic  | Grade |   |   |   |   |   |   |   |   |    |    |    |
|--|-------|---|---|---|---|---|---|---|---|----|----|----|
|  | 1     | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Whole Number: Meaning                          | ●     | ● | ● | ● | ● |   |   |   |   |    |    |    |
| Whole Number: Operations                       | ●     | ● | ● | ● | ● |   |   |   |   |    |    |    |
| Measurement Units                              | ●     | ● | ● | ● | ● | ● | ● |   |   |    |    |    |
| Common Fractions                               |       |   | ● | ● | ● | ● |   |   |   |    |    |    |
| Equations & Formulas                           |       |   | ● | ● | ● | ● | ● | ● | ● | ●  | ●  | ●  |
| Data Representation & Analysis                 |       |   | ● | ● | ● | ● | ● | ● | ● | ●  | ●  | ●  |
| 2-D Geometry: Basics                           |       |   | ● | ● | ● | ● | ● | ● | ● | ●  |    |    |
| 2-D Geometry: Polygons & Circles               |       |   |   | ● | ● | ● | ● | ● | ● | ●  |    |    |
| Measurement: Perimeter, Area & Volume          |       |   |   | ● | ● | ● | ● | ● | ● |    |    |    |
| Rounding & Significant Figures                 |       |   |   | ● | ● | ● |   |   |   |    |    |    |
| Estimating Computations                        |       |   |   | ● | ● | ● |   |   |   |    |    |    |
| Whole Numbers: Properties of Operations        |       |   |   | ● | ● | ● |   |   |   |    |    |    |
| Estimating Quantity & Size                     |       |   |   | ● | ● | ● |   |   |   |    |    |    |
| Decimal Fractions                              |       |   |   | ● | ● | ● |   |   |   |    |    |    |
| Relation of Common & Decimal Fractions         |       |   |   | ● | ● | ● |   |   |   |    |    |    |
| Properties of Common & Decimal Fractions       |       |   |   | ● | ● | ● |   |   |   |    |    |    |
| Percentages                                    |       |   |   | ● | ● | ● |   |   |   |    |    |    |
| Proportionality Concepts                       |       |   |   | ● | ● | ● | ● | ● |   |    |    |    |
| Proportionality Problems                       |       |   |   | ● | ● | ● | ● | ● | ● | ●  |    |    |
| 2-D Geometry: Coordinate Geometry              |       |   |   | ● | ● | ● | ● | ● | ● | ●  | ●  |    |
| Geometry: Transformations                      |       |   |   |   | ● | ● | ● | ● | ● | ●  |    | ●  |
| Negative Numbers, Integers, & Their Properties |       |   |   |   | ● | ● | ● | ● | ● | ●  |    |    |
| Number Theory                                  |       |   |   |   |   | ● | ● | ● | ● | ●  |    |    |
| Exponents, Roots & Radicals                    |       |   |   |   |   | ● | ● | ● | ● | ●  |    |    |
| Exponents & Orders of Magnitude                |       |   |   |   |   | ● | ● | ● | ● | ●  |    |    |
| Measurement: Estimation & Errors               |       |   |   |   |   | ● | ● | ● | ● | ●  |    |    |
| Constructions Using Straightedge & Compass     |       |   |   |   |   | ● | ● | ● | ● | ●  | ●  | ●  |
| 3-D Geometry                                   |       |   |   |   |   | ● | ● | ● | ● | ●  | ●  | ●  |
| Geometry: Congruence & Similarity              |       |   |   |   |   |   | ● | ● | ● | ●  |    |    |
| Rational Numbers & Their Properties            |       |   |   |   |   |   | ● | ● | ● | ●  | ●  | ●  |
| Patterns, Relations & Functions                |       |   |   |   |   |   | ● | ● | ● | ●  | ●  | ●  |
| Proportionality: Slope & Trigonometry          |       |   |   |   |   |   | ● | ● | ● | ●  |    |    |
| Real Numbers, Their Subsets & Properties       |       |   |   |   |   |   |   | ● | ● | ●  | ●  | ●  |
| Validation & Justification                     |       |   |   |   |   |   |   | ● | ● | ●  | ●  | ●  |
| Structuring & Abstracting                      |       |   |   |   |   |   |   | ● | ● | ●  | ●  | ●  |
| Uncertainty & Probability                      |       |   |   |   |   |   |   |   | ● | ●  | ●  | ●  |
| Complex Numbers & Their Properties             |       |   |   |   |   |   |   |   | ● | ●  | ●  | ●  |
| Infinite Processes                             |       |   |   |   |   |   |   |   |   | ●  | ●  | ●  |
| Change   |       |   |   |   |   |   |   |   |   | ●  | ●  | ●  |
| Vectors  |       |   |   |   |   |   |   |   |   | ●  | ●  | ●  |
| Systematic Counting                            |       |   |   |   |   |   |   |   |   | ●  | ●  | ●  |

● Intended by 4, 5, or 6 of the top achieving countries

# Matemáticas programadas para cada grado, en países de mayor logro

| Topic  | Grade |   |   |   |   |   |   |   |
|--|-------|---|---|---|---|---|---|---|
|  | 1     | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Whole Number: Meaning                          | •     | • | • | • | • |   |   |   |
| Whole Number: Operations                       | •     | • | • | • | • |   |   |   |
| Measurement Units                              | •     | • | • | • | • | • | • |   |
| Common Fractions                               |       |   | • | • | • | • |   |   |
| Equations & Formulas                           |       |   | • | • | • | • | • | • |
| Data Representation & Analysis                 |       |   | • | • | • | • | • | • |
| 2-D Geometry: Basics                           |       |   | • | • | • | • | • | • |
| 2-D Geometry: Polygons & Circles               |       |   |   | • | • | • | • | • |
| Measurement: Perimeter, Area & Volume          |       |   |   | • | • | • | • | • |
| Rounding & Significant Figures                 |       |   |   | • | • | • |   |   |
| Estimating Computations                        |       |   |   | • | • | • |   |   |
| Whole Numbers: Properties of Operations        |       |   |   | • | • | • |   |   |
| Estimating Quantity & Size                     |       |   |   | • | • | • |   |   |
| Decimal Fractions                              |       |   |   | • | • | • |   |   |
| Relation of Common & Decimal Fractions         |       |   |   | • | • | • |   |   |
| Properties of Common & Decimal Fractions       |       |   |   | • | • | • |   |   |
| Percentages                                    |       |   |   |   | • | • |   |   |
| Proportionality Concepts                       |       |   |   |   | • | • | • | • |
| Proportionality Problems                       |       |   |   |   | • | • | • | • |
| 2-D Geometry: Coordinate Geometry              |       |   |   |   | • | • | • | • |
| Geometry: Transformations                      |       |   |   |   |   | • | • | • |
| Negative Numbers, Integers, & Their Properties |       |   |   |   |   | • | • | • |
| Number Theory                                  |       |   |   |   |   |   | • | • |
| Exponents, Roots & Radicals                    |       |   |   |   |   |   | • | • |
| Exponents & Orders of Magnitude                |       |   |   |   |   |   | • | • |
| Measurement: Estimation & Errors               |       |   |   |   |   |   | • | • |
| Constructions Using Straightedge & Compass     |       |   |   |   |   |   | • | • |
| 3-D Geometry                                   |       |   |   |   |   |   | • | • |
| Geometry: Congruence & Similarity              |       |   |   |   |   |   |   | • |
| Rational Numbers & Their Properties            |       |   |   |   |   |   |   | • |
| Patterns, Relations & Functions                |       |   |   |   |   |   |   | • |
| Proportionality: Slope & Trigonometry          |       |   |   |   |   |   |   | • |

Intended by at least two-thirds of the top-achieving countries 

# 2000 NCTM Estándares de Matemáticas

| Topic   | Grade |   |   |   |   |   |   |   |
|---|-------|---|---|---|---|---|---|---|
|   | 1     | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Whole Number Meaning                          | ●     | ● | ● | ● | ● |   |   |   |
| Whole Number Operations                       | ●     | ● | ● | ● | ● |   |   |   |
| Measurement Units                             | ●     | ● | ● | ● | ● | ● | ● | ● |
| Common Fractions                              | ●     | ● | ● | ● | ● | ● | ● | ● |
| Equations & Formulas                          |       |   | ● | ● | ● | ● | ● | ● |
| Data Representation & Analysis                | ●     | ● | ● | ● | ● | ● | ● | ● |
| 2-D Geometry: Basics                          | ●     | ● | ● | ● | ● | ● | ● | ● |
| Polygons & Circles                            | ●     | ● | ● | ● | ● | ● | ● | ● |
| Perimeter, Area & Volume                      | ●     | ● | ● | ● | ● | ● | ● | ● |
| Rounding & Significant Figures                |       |   | ● | ● | ● | ● | ● | ● |
| Estimating Computations                       | ●     | ● | ● | ● | ● | ● | ● | ● |
| Properties of Whole Number Operations         | ●     | ● | ● | ● | ● |   |   |   |
| Estimating Quantity & Size                    |       |   |   | ● | ● | ● | ● | ● |
| Decimal Fractions                             |       |   | ● | ● | ● | ● | ● | ● |
| Relationship of Common & Decimal Fractions    |       |   | ● | ● | ● | ● | ● | ● |
| Properties of Common & Decimal Fractions      |       |   |   |   | ● | ● | ● | ● |
| Percentages                                   |       |   | ● | ● | ● | ● | ● | ● |
| Proportionality Concepts                      |       |   |   |   | ● | ● | ● | ● |
| Proportionality Problems                      |       |   |   |   | ● | ● | ● | ● |
| 2-D Coordinate Geometry                       | ●     | ● | ● | ● | ● | ● | ● | ● |
| Geometry: Transformations                     | ●     | ● | ● | ● | ● | ● | ● | ● |
| Negative Numbers, Integers & Their Properties |       |   | ● | ● | ● | ● | ● | ● |
| Number Theory                                 |       |   |   |   |   | ● | ● | ● |
| Exponents, Roots & Radicals                   |       |   |   |   |   | ● | ● | ● |
| Exponents & Orders of Magnitude               |       |   |   |   |   | ● | ● | ● |
| Measurement Estimation & Errors               | ●     | ● | ● | ● | ● | ● | ● | ● |
| Constructions w/ Straightedge & Compass       | ●     | ● | ● | ● | ● | ● | ● | ● |
| 3-D Geometry                                  | ●     | ● | ● | ● | ● | ● | ● | ● |
| Congruence & Similarity                       | ●     | ● | ● | ● | ● | ● | ● | ● |
| Rational Numbers & Their Properties           |       |   |   |   |   | ● | ● | ● |
| Patterns, Relations & Functions               | ●     | ● | ● | ● | ● | ● | ● | ● |
| Slope & Trigonometry                          |       |   |   |   |   | ● | ● | ● |

Top Achieving Countries' Profile   
 Topic Intended 

# Matemáticas programadas para cada grado, en 6 países

| Topic  | Bulgaria |   |   |   |   |   |   |   | Germany |   |   |   |   |   |   |   | Mexico |   |   |   |   |   |   |   |   |
|--|----------|---|---|---|---|---|---|---|---------|---|---|---|---|---|---|---|--------|---|---|---|---|---|---|---|---|
|  | 1        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1       | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1      | 2 | 3 | 4 | 5 | 6 | 7 | 8 |   |
| Whole Number: Meaning                          |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Whole Number: Operations                       | •        | • | • | • | • | • | • | • | •       | • | • | • | • | • | • | • | •      | • | • | • | • | • | • | • | • |
| Measurement Units                              | •        | • | • | • | • | • | • | • | •       | • | • | • | • | • | • | • | •      | • | • | • | • | • | • | • | • |
| Common Fractions                               |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Equations & Formulas                           |          | • | • | • | • | • | • | • | •       | • | • | • | • | • | • | • | •      | • | • | • | • | • | • | • | • |
| Data Representation & Analysis                 |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| 2-D Geometry: Basics                           |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| 2-D Geometry: Polygons & Circles               | •        | • | • | • | • | • | • | • | •       | • | • | • | • | • | • | • | •      | • | • | • | • | • | • | • | • |
| Measurement: Perimeter, Area & Volume          |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Rounding & Significant Figures                 |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Estimating Computations                        |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Whole Numbers: Properties of Operations        | •        | • | • | • | • | • | • | • | •       | • | • | • | • | • | • | • | •      | • | • | • | • | • | • | • | • |
| Estimating Quantity & Size                     |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Decimal Fractions                              |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Relation of Common & Decimal Fractions         |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Properties of Common & Decimal Fractions       |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Percentages                                    |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Proportionality Concepts                       |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Proportionality Problems                       |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| 1-D and 2-D Geometry: Coordinate Geometry      |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Geometry: Transformations                      |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Negative Numbers, Integers, & Their Properties |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Number Theory                                  |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Exponents, Roots & Radicals                    |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Exponents & Orders of Magnitude                |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Measurement: Estimation & Errors               |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Constructions using Straightedge & Compass     |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| 3-D Geometry                                   |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Geometry: Congruence & Similarity              |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Rational Numbers & Their Properties            |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Patterns, Relations & Functions                |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |
| Proportionality: Slope & Trigonometry          |          |   |   |   |   |   |   |   |         |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |   |

| Topic  | South Korea |   |   |   |   |   |   |   | Taiwan |   |   |   |   |   |   |   | United States |   |   |   |   |   |   |   |   |
|--|-------------|---|---|---|---|---|---|---|--------|---|---|---|---|---|---|---|---------------|---|---|---|---|---|---|---|---|
|  | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1      | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1             | 2 | 3 | 4 | 5 | 6 | 7 | 8 |   |
| Whole Number: Meaning                          |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Whole Number: Operations                       | •           | • | • | • | • | • | • | • | •      | • | • | • | • | • | • | • | •             | • | • | • | • | • | • | • | • |
| Measurement Units                              | •           | • | • | • | • | • | • | • | •      | • | • | • | • | • | • | • | •             | • | • | • | • | • | • | • | • |
| Common Fractions                               |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Equations & Formulas                           |             | • | • | • | • | • | • | • | •      | • | • | • | • | • | • | • | •             | • | • | • | • | • | • | • | • |
| Data Representation & Analysis                 |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| 2-D Geometry: Basics                           |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| 2-D Geometry: Polygons & Circles               |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Measurement: Perimeter, Area & Volume          |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Rounding & Significant Figures                 |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Estimating Computations                        |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Whole Numbers: Properties of Operations        |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Estimating Quantity & Size                     |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Decimal Fractions                              |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Relation of Common & Decimal Fractions         |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Properties of Common & Decimal Fractions       |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Percentages                                    |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Proportionality Concepts                       |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Proportionality Problems                       |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| 1-D and 2-D Geometry: Coordinate Geometry      |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Geometry: Transformations                      |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Negative Numbers, Integers, & Their Properties |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Number Theory                                  |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Exponents, Roots & Radicals                    |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Exponents & Orders of Magnitude                |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Measurement: Estimation & Errors               |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Constructions using Straightedge & Compass     |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| 3-D Geometry                                   |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Geometry: Congruence & Similarity              |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Rational Numbers & Their Properties            |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Patterns, Relations & Functions                |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |
| Proportionality: Slope & Trigonometry          |             |   |   |   |   |   |   |   |        |   |   |   |   |   |   |   |               |   |   |   |   |   |   |   |   |

• Topic Intended  
 ■ More than Half of Top-Achieving Countries

***Evaluación sensible al  
currículo***

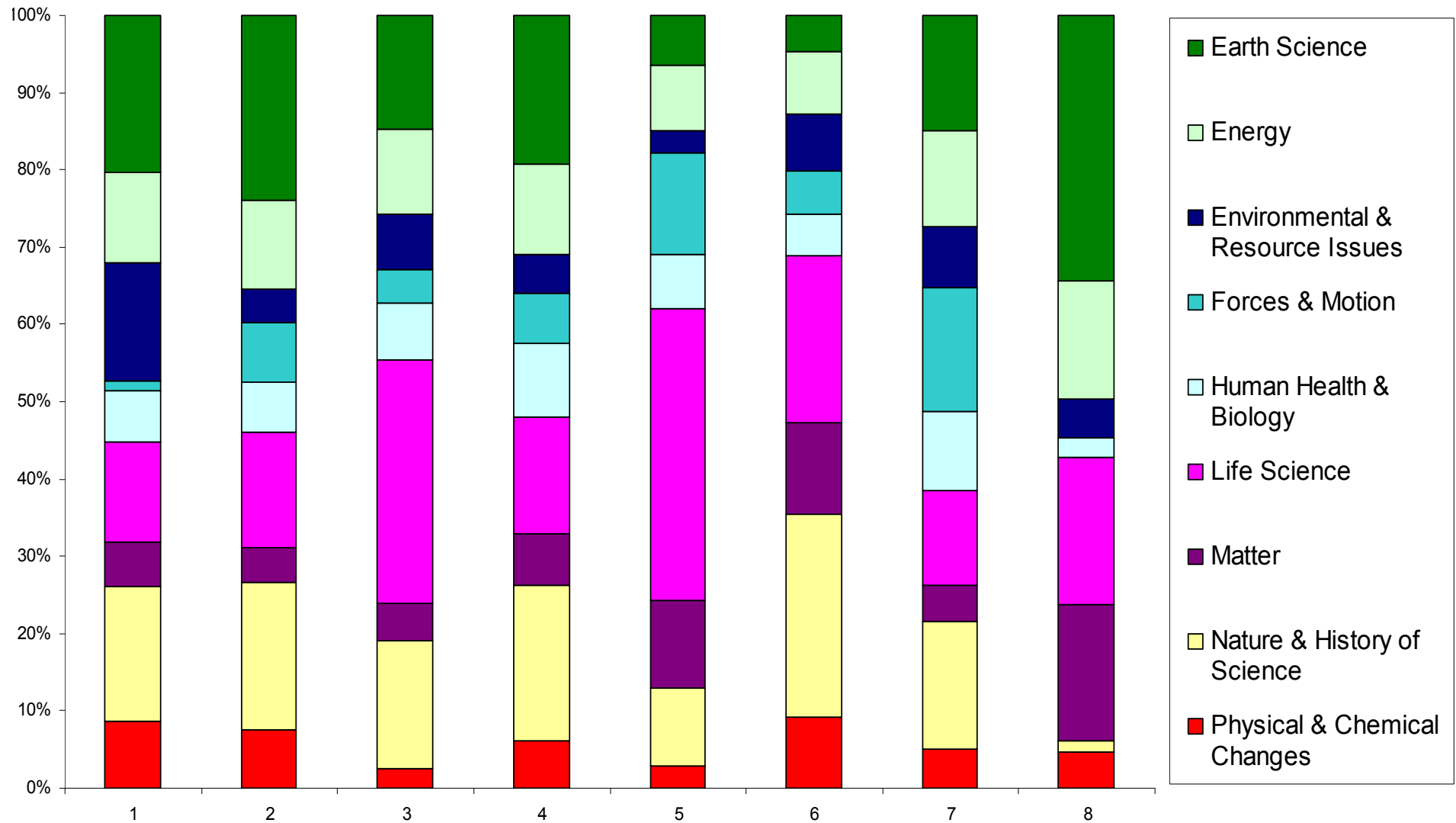


# Midiendo el currículo aplicado

- **Temas cubiertos en clase**
- **Los maestros indican el número de clases en las que cubren un tema**
- **Lista de temas proviene de un marco general**
- **El nivel de cubrimiento de un tema por parte del maestro puede ser evaluado en relación con el desempeño de los estudiantes y con los temas del marco general**
- **La relación puede ser examinada a nivel del salón ó del colegio**

# Ejemplo de Currículo Aplicado

## Tiempo promedio de enseñanza de 9 áreas de ciencias



# Diseño de evaluaciones sensibles al currículo

- Sirven para descubrir lo que los estudiantes saben en cada grado (3° - 12°) en múltiples áreas;
- Evaluaciones apropiadas para 3 grados;
- Cada evaluación tiene diferentes formatos creados utilizando un muestreo matricial de items;
- Diseñado para brindar un amplio cubrimiento de las áreas;
- Los formatos se distribuyen al azar al interior de cada salón de clase.

***Por qué es importante la  
evaluación sensible al  
currículo***

# Desempeño en tópicos específicos en matemáticas 1995 TIMSS

| Whole Numbers      |      | Common Fractions   |      | Decimal Fractions & Percentages |      | Relationships of Fractions |      | Estimations of Quantity/Size |      | Rounding           |      | Estimating Computations |      | Measurement Units  |      | Perimeter, Area, Volume |      | Measurement Estimations & Errors |      |
|--------------------|------|--------------------|------|---------------------------------|------|----------------------------|------|------------------------------|------|--------------------|------|-------------------------|------|--------------------|------|-------------------------|------|----------------------------------|------|
| Singapore          | 80.4 | Singapore          | 82.4 | Singapore                       | 77.9 | Singapore                  | 85.1 | Japan                        | 77.9 | Czech Republic     | 86.9 | Singapore               | 75.8 | Singapore          | 77.9 | Singapore               | 84.5 | Czech Republic                   | 82.9 |
| Japan              | 72.0 | Japan              | 72.2 | Czech Republic                  | 72.5 | Korea                      | 77.6 | Singapore                    | 77.3 | Singapore          | 86.6 | Czech Republic          | 69.8 | Japan              | 74.8 | Japan                   | 72.6 | Singapore                        | 81.0 |
| Switzerland        | 70.2 | Korea              | 69.9 | Hong Kong                       | 71.1 | Hong Kong                  | 71.1 | England                      | 72.2 | Canada             | 84.7 | Japan                   | 69.0 | Czech Republic     | 73.2 | Hong Kong               | 63.9 | Sweden                           | 80.8 |
| Belgium (Fl)       | 68.6 | Hong Kong          | 69.4 | Japan                           | 69.8 | Hong Kong                  | 74.1 | Hong Kong                    | 71.8 | Korea              | 83.8 | Korea                   | 66.7 | Slovenia           | 72.0 | Korea                   | 61.8 | Korea                            | 79.5 |
| Austria            | 68.4 | Belgium (Fl)       | 68.7 | Slovak Republic                 | 69.1 | Belgium (Fl)               | 71.3 | Switzerland                  | 71.8 | Iceland            | 83.1 | Belgium (Fl)            | 64.1 | Slovak Republic    | 71.9 | Austria                 | 50.4 | Belgium (Fl)                     | 78.9 |
| Korea              | 67.6 | Switzerland        | 62.4 | Hungary                         | 68.7 | Switzerland                | 70.0 | Czech Republic               | 71.7 | Slovak Republic    | 82.4 | Switzerland             | 62.5 | Belgium (Fl)       | 71.8 | Czech Republic          | 48.9 | Hungary                          | 78.2 |
| Czech Republic     | 67.4 | Ireland            | 61.7 | Korea                           | 68.4 | France                     | 67.2 | Netherlands                  | 71.2 | Belgium (Fl)       | 81.0 | Canada                  | 61.3 | Switzerland        | 71.6 | Slovak Republic         | 47.9 | Switzerland                      | 78.2 |
| Hong Kong          | 65.4 | Austria            | 60.4 | Austria                         | 66.6 | Austria                    | 66.8 | Belgium (Fl)                 | 70.7 | Hungary            | 79.8 | Canada Republic         | 61.1 | Sweden             | 69.5 | Switzerland             | 46.6 | Austria                          | 77.7 |
| Slovak Republic    | 64.6 | Belgium (Fr)       | 59.8 | Russian Federation              | 65.9 | Belgium (Fr)               | 65.8 | Korea                        | 70.7 | Japan              | 79.6 | Ireland                 | 60.5 | France             | 69.0 | Slovenia                | 45.8 | Netherlands                      | 76.1 |
| France             | 64.5 | Slovenia           | 59.7 | France                          | 64.9 | Canada                     | 65.1 | Austria                      | 69.9 | USA                | 79.2 | Sweden                  | 60.0 | Austria            | 68.1 | Austria                 | 45.6 | France                           | 75.2 |
| Slovenia           | 63.4 | Czech Republic     | 59.6 | Belgium (Fl)                    | 64.6 | Czech Republic             | 64.9 | Australia                    | 69.3 | Netherlands        | 78.5 | Australia               | 59.1 | Belgium (Fr)       | 68.1 | Bulgaria                | 45.2 | Slovak Republic                  | 75.2 |
| Russian Federation | 62.7 | Netherlands        | 58.9 | Slovenia                        | 62.9 | Ireland                    | 64.3 | Hungary                      | 69.3 | Sweden             | 78.5 | Austria                 | 58.9 | Ireland            | 68.1 | Russian Federation      | 44.6 | Australia                        | 74.5 |
| Bulgaria           | 62.5 | Slovak Republic    | 58.6 | Switzerland                     | 61.9 | Slovak Republic            | 63.0 | Sweden                       | 69.3 | Australia          | 77.5 | Netherlands             | 58.7 | Bulgaria           | 68.0 | France                  | 44.1 | Norway                           | 74.5 |
| Ireland            | 62.2 | France             | 57.8 | Canada                          | 61.0 | Germany                    | 62.6 | Slovak Republic              | 69.1 | Switzerland        | 77.4 | Hong Kong               | 57.8 | Korea              | 67.9 | Netherlands             | 44.0 | Denmark                          | 73.0 |
| Spain              | 60.8 | Hungary            | 57.7 | Netherlands                     | 59.2 | Netherlands                | 62.5 | France                       | 69.0 | France             | 76.5 | New Zealand             | 57.6 | Hungary            | 67.5 | Belgium (Fr)            | 43.0 | Germany                          | 72.9 |
| Hungary            | 60.6 | Israel             | 57.4 | Belgium (Fr)                    | 58.6 | Slovenia                   | 62.4 | Germany                      | 69.0 | Austria            | 75.9 | Hungary                 | 57.3 | Netherlands        | 66.8 | Hungary                 | 42.9 | Hong Kong                        | 72.7 |
| Sweden             | 58.9 | Canada             | 56.2 | Thailand                        | 58.0 | Sweden                     | 62.2 | Canada                       | 67.8 | Thailand           | 75.4 | Norway                  | 57.0 | Norway             | 66.4 | Australia               | 42.1 | Japan                            | 72.5 |
| Canada             | 57.9 | Russian Federation | 55.8 | Netherlands                     | 57.8 | Australia                  | 61.0 | Scotland                     | 68.8 | France             | 74.7 | USA                     | 55.7 | Russian Federation | 65.9 | Canada                  | 40.4 | Slovenia                         | 72.5 |
| Israel             | 59.0 | Australia          | 55.4 | Bulgaria                        | 57.8 | Hungary                    | 60.7 | Norway                       | 66.6 | Slovenia           | 74.7 | Iceland                 | 54.7 | Denmark            | 65.4 | Thailand                | 40.0 | England                          | 71.8 |
| Thailand           | 56.0 | Thailand           | 54.2 | Ireland                         | 57.3 | Bulgaria                   | 59.9 | Belgium (Fr)                 | 65.8 | New Zealand        | 74.4 | England                 | 54.4 | Hong Kong          | 65.2 | Ireland                 | 39.4 | New Zealand                      | 70.6 |
| International      | 55.7 | Bulgaria           | 54.2 | Germany                         | 57.2 | Thailand                   | 59.6 | Slovenia                     | 65.5 | Hong Kong          | 74.2 | Slovenia                | 52.6 | Australia          | 65.0 | Sweden                  | 39.3 | Scotland                         | 69.9 |
| Germany            | 55.4 | Sweden             | 53.1 | Israel                          | 56.3 | Norway                     | 59.6 | New Zealand                  | 65.3 | Russian Federation | 73.5 | Germany                 | 52.0 | Germany            | 63.5 | International           | 39.0 | Canada                           | 69.7 |
| Latvia             | 55.4 | International      | 52.3 | USA                             | 55.8 | Russian Federation         | 59.2 | Ireland                      | 64.4 | England            | 74.2 | Israel                  | 51.9 | Iceland            | 63.0 | Romania                 | 38.2 | Ireland                          | 69.6 |
| Belgium (Fr)       | 55.4 | Cyprus             | 51.9 | International                   | 55.3 | Iceland                    | 59.2 | Denmark                      | 64.3 | Scotland           | 73.4 | Scotland                | 51.6 | Canada             | 63.0 | England                 | 37.1 | Russian Federation               | 69.6 |
| Australia          | 55.0 | Germany            | 51.7 | Lithuania                       | 55.4 | USA                        | 58.5 | Russian Federation           | 63.5 | Norway             | 72.3 | France                  | 50.8 | Israel             | 63.0 | Cyprus                  | 36.9 | Latvia                           | 66.9 |
| Lithuania          | 53.8 | New Zealand        | 51.5 | Norway                          | 54.1 | Israel                     | 57.6 | USA                          | 62.7 | Denmark            | 71.2 | Belgium (Fr)            | 50.6 | Spain              | 62.4 | Israel                  | 36.9 | Thailand                         | 66.1 |
| Netherlands        | 53.5 | Norway             | 51.2 | Australia                       | 53.5 | International              | 57.0 | Bulgaria                     | 62.4 | International      | 70.9 | Russian Federation      | 50.0 | Thailand           | 62.3 | Norway                  | 36.4 | International                    | 64.8 |
| Norway             | 53.4 | USA                | 49.3 | Latvia                          | 52.9 | New Zealand                | 56.8 | Iceland                      | 61.6 | Belgium (Fr)       | 70.2 | Thailand                | 49.5 | International      | 61.6 | Scotland                | 35.7 | Belgium (Fr)                     | 64.6 |
| Greece             | 52.7 | Scotland           | 49.3 | Iceland                         | 52.6 | England                    | 53.8 | International                | 61.1 | Germany            | 69.9 | International           | 50.9 | New Zealand        | 61.3 | Denmark                 | 35.5 | Israel                           | 63.3 |
| USA                | 52.3 | England            | 49.2 | Greece                          | 52.6 | Denmark                    | 51.9 | Latvia                       | 59.5 | Lithuania          | 69.2 | Greece                  | 46.3 | England            | 60.5 | New Zealand             | 35.0 | USA                              | 62.5 |
| Romania            | 52.3 | Spain              | 49.2 | Spain                           | 50.6 | Scotland                   | 51.5 | Israel                       | 58.4 | Israel             | 68.8 | Denmark                 | 46.0 | Latvia             | 60.3 | Latvia                  | 33.6 | Iceland                          | 61.6 |
| Denmark            | 51.0 | Denmark            | 49.0 | Portugal                        | 49.9 | Greece                     | 51.3 | Thailand                     | 57.1 | Bulgaria           | 68.1 | Bulgaria                | 44.9 | Romania            | 59.3 | Iceland                 | 33.1 | Greece                           | 59.4 |
| Portugal           | 49.0 | Latvia             | 47.3 | New Zealand                     | 49.3 | Cyprus                     | 50.9 | Spain                        | 54.8 | Portugal           | 65.0 | Spain                   | 44.1 | Greece             | 58.4 | Germany                 | 32.9 | Spain                            | 55.3 |
| New Zealand        | 48.6 | Greece             | 47.3 | Denmark                         | 48.8 | Lithuania                  | 49.0 | Greece                       | 54.5 | Cyprus             | 64.4 | Lithuania               | 42.3 | Scotland           | 58.5 | Lithuania               | 32.2 | Lithuania                        | 55.1 |
| Iceland            | 48.4 | Romania            | 47.0 | Scotland                        | 47.3 | Spain                      | 48.2 | Lithuania                    | 53.0 | Greece             | 64.1 | Cyprus                  | 39.7 | Cyprus             | 55.0 | Spain                   | 29.9 | Portugal                         | 54.9 |
| Scotland           | 47.9 | Iceland            | 44.4 | Romania                         | 46.9 | Latvia                     | 47.2 | Portugal                     | 50.7 | Latvia             | 63.3 | Latvia                  | 38.9 | Portugal           | 55.0 | Greece                  | 29.8 | Bulgaria                         | 52.8 |
| England            | 46.8 | Lithuania          | 39.1 | England                         | 45.9 | Romania                    | 45.8 | Romania                      | 46.4 | Spain              | 62.2 | Portugal                | 38.2 | Lithuania          | 54.6 | USA                     | 27.8 | Romania                          | 50.0 |
| Cyprus             | 45.8 | Iran               | 37.9 | Cyprus                          | 43.5 | Portugal                   | 43.2 | Cyprus                       | 43.9 | Romania            | 57.5 | Romania                 | 38.0 | USA                | 53.0 | Portugal                | 22.8 | Cyprus                           | 45.7 |
| Iran               | 43.4 | Portugal           | 34.8 | Philippines                     | 42.2 | Philippines                | 35.7 | Philippines                  | 36.9 | Philippines        | 49.2 | Philippines             | 30.9 | Iran               | 44.2 | Iran                    | 21.1 | Philippines                      | 36.0 |
| Philippines        | 38.0 | Philippines        | 30.0 | Iran                            | 33.7 | Iran                       | 35.3 | Kuwait                       | 34.7 | Colombia           | 47.6 | Colombia                | 28.7 | Kuwait             | 14.7 | Kuwait                  | 14.7 | Iran                             | 35.5 |
| Colombia           | 34.2 | Colombia           | 27.3 | Colombia                        | 31.9 | Colombia                   | 27.3 | Colombia                     | 33.8 | Iran               | 46.3 | Iran                    | 27.0 | Philippines        | 35.7 | Philippines             | 14.4 | Kuwait                           | 35.1 |
| Kuwait             | 26.4 | Kuwait             | 25.2 | South Africa                    | 28.3 | South Africa               | 27.2 | Iran                         | 33.4 | Kuwait             | 44.5 | South Africa            | 20.3 | Philippines        | 32.1 | Colombia                | 11.9 | Colombia                         | 32.4 |
| South Africa       | 26.0 | South Africa       | 20.2 | Kuwait                          | 27.5 | Kuwait                     | 25.0 | South Africa                 | 28.6 | South Africa       | 36.8 | Kuwait                  | 20.2 | South Africa       | 27.3 | South Africa            | 8.3  | South Africa                     | 28.1 |

Promedio Internacional

Promedio Bélgica (Fr)

# Desempeño en tópicos específicos en matemáticas 1995 TIMSS

| Whole Numbers      | Common Fractions | Decimal Fractions & Percentages | Relationships of Fractions | Estimations of Quantity/Size | Rounding | Estimating Computations | Measurement Units | Perimeter, Area, Volume | Measurement Estimations & Errors |                    |      |
|--------------------|------------------|---------------------------------|----------------------------|------------------------------|----------|-------------------------|-------------------|-------------------------|----------------------------------|--------------------|------|
| Singapore          | 80.4             | Singapore                       | 82.4                       | Singapore                    | 77.9     | Singapore               | 75.8              | Singapore               | 84.5                             | Czech Republic     | 82.9 |
| Japan              | 72.0             | Japan                           | 72.2                       | Czech Republic               | 72.5     | Japan                   | 74.8              | Japan                   | 72.6                             | Singapore          | 81.0 |
| Switzerland        | 70.2             | Korea                           | 69.9                       | Hong Kong                    | 71.1     | Switzerland             | 73.2              | Hong Kong               | 63.9                             | Sweden             | 80.8 |
| Belgium (Fl)       | 68.6             | Hong Kong                       | 69.4                       | Japan                        | 74.1     | Korea                   | 66.7              | Slovenia                | 72.0                             | Korea              | 61.8 |
| Austria            | 68.4             | Belgium (Fl)                    | 68.7                       | Slovak Republic              | 69.1     | Iceland                 | 83.1              | Slovak Republic         | 71.9                             | Austria            | 50.4 |
| Korea              | 67.6             | Switzerland                     | 62.4                       | Hungary                      | 68.7     | Slovak Republic         | 82.4              | Belgium (Fl)            | 71.8                             | Czech Republic     | 48.9 |
| Czech Republic     | 67.4             | Ireland                         | 61.7                       | Korea                        | 68.4     | Belgium (Fl)            | 81.0              | Switzerland             | 71.6                             | Slovak Republic    | 47.9 |
| Hong Kong          | 65.4             | Austria                         | 60.4                       | Austria                      | 66.6     | Hungary                 | 79.8              | Sweden                  | 69.5                             | Switzerland        | 46.6 |
| Slovak Republic    | 64.6             | Belgium (Fr)                    | 59.8                       | Russian Federation           | 65.9     | Japan                   | 79.6              | France                  | 60.5                             | Slovenia           | 45.8 |
| France             | 64.5             | Slovenia                        | 59.7                       | France                       | 64.9     | USA                     | 79.2              | Austria                 | 68.1                             | Belgium (Fl)       | 45.6 |
| Slovenia           | 63.4             | Czech Republic                  | 59.6                       | Belgium (Fl)                 | 64.6     | Netherlands             | 78.5              | Bulgaria                | 68.1                             | Bulgaria           | 45.2 |
| Russian Federation | 62.7             | Netherlands                     | 58.9                       | Slovenia                     | 62.9     | Australia               | 59.1              | Ireland                 | 68.1                             | Russian Federation | 44.6 |
| Bulgaria           | 62.5             | Switzerland                     | 61.9                       | Ireland                      | 64.3     | Sweden                  | 78.5              | Bulgaria                | 68.0                             | France             | 44.1 |
| Ireland            | 62.2             | France                          | 57.8                       | Slovak Republic              | 63.0     | Australia               | 77.5              | Korea                   | 67.9                             | Netherlands        | 44.0 |
| Spain              | 60.8             | Hungary                         | 57.7                       | Germany                      | 62.6     | Switzerland             | 77.4              | Hungary                 | 67.9                             | Netherlands        | 44.0 |
| Hungary            | 60.6             | Sweden                          | 59.2                       | Netherlands                  | 62.5     | Ireland                 | 76.5              | Hungary                 | 67.5                             | Belgium (Fr)       | 43.0 |
| Sweden             | 58.9             | Belgium (Fr)                    | 58.6                       | Austria                      | 62.4     | Austria                 | 75.9              | Netherlands             | 66.8                             | Hungary            | 42.9 |
| Canada             | 57.9             | Canada                          | 56.2                       | Canada                       | 67.8     | Thailand                | 75.4              | Norway                  | 57.0                             | Australia          | 42.1 |
| Israel             | 59.0             | Russian Federation              | 55.8                       | Australia                    | 61.0     | France                  | 74.7              | Russian Federation      | 65.9                             | Canada             | 40.4 |
| Thailand           | 56.0             | Australia                       | 55.4                       | Hungary                      | 60.7     | Slovenia                | 74.7              | Iceland                 | 54.7                             | Thailand           | 40.0 |
| International      | 55.7             | Thailand                        | 54.2                       | Bulgaria                     | 59.9     | New Zealand             | 74.4              | England                 | 54.4                             | Ireland            | 39.4 |
| Germany            | 55.4             | Bulgaria                        | 54.2                       | Thailand                     | 59.6     | Hong Kong               | 74.2              | Slovenia                | 52.6                             | Sweden             | 39.3 |
| Latvia             | 55.4             | Sweden                          | 53.1                       | Norway                       | 59.6     | New Zealand             | 65.3              | Germany                 | 52.0                             | International      | 39.0 |
| Belgium (Fr)       | 55.4             | International                   | 52.3                       | Russian Federation           | 59.2     | Ireland                 | 64.4              | Israel                  | 51.9                             | Romania            | 38.2 |
| Australia          | 55.0             | Cyprus                          | 51.9                       | Iceland                      | 59.2     | Denmark                 | 64.3              | Scotland                | 51.6                             | England            | 37.1 |
| Lithuania          | 53.8             | Germany                         | 51.7                       | USA                          | 58.5     | Russian Federation      | 63.5              | France                  | 50.8                             | Cyprus             | 36.9 |
| Netherlands        | 53.5             | New Zealand                     | 51.5                       | Israel                       | 57.6     | USA                     | 62.7              | Denmark                 | 71.2                             | Spain              | 36.9 |
| Norway             | 53.4             | Norway                          | 51.2                       | Australia                    | 57.0     | Bulgaria                | 62.4              | Denmark                 | 71.2                             | Israel             | 36.9 |
| Norway             | 53.4             | USA                             | 49.3                       | New Zealand                  | 56.8     | Iceland                 | 61.6              | Russian Federation      | 50.0                             | Thailand           | 36.4 |
| Greece             | 52.7             | Scotland                        | 49.3                       | Iceland                      | 61.6     | International           | 61.1              | Thailand                | 49.5                             | International      | 61.6 |
| USA                | 52.3             | England                         | 49.2                       | England                      | 53.8     | Latvia                  | 59.5              | International           | 50.9                             | New Zealand        | 61.3 |
| Romania            | 52.3             | Greece                          | 52.6                       | Denmark                      | 51.9     | Lithuania               | 69.2              | Greece                  | 46.3                             | England            | 60.5 |
| Denmark            | 51.0             | Spain                           | 50.6                       | Scotland                     | 51.5     | Israel                  | 68.8              | Denmark                 | 46.0                             | Latvia             | 60.3 |
| Portugal           | 49.0             | Denmark                         | 49.0                       | Greece                       | 51.3     | Thailand                | 57.1              | Bulgaria                | 44.9                             | Romania            | 59.3 |
| New Zealand        | 48.6             | Latvia                          | 47.3                       | Cyprus                       | 50.9     | Spain                   | 54.8              | Spain                   | 44.1                             | Iceland            | 33.1 |
| Iceland            | 48.4             | Greece                          | 47.3                       | Lithuania                    | 49.0     | Portugal                | 65.0              | Greece                  | 42.3                             | Greece             | 58.4 |
| Scotland           | 47.9             | Romania                         | 47.0                       | Cyprus                       | 54.5     | Cyprus                  | 64.4              | Scotland                | 42.3                             | Scotland           | 58.5 |
| England            | 46.8             | Scotland                        | 47.3                       | Lithuania                    | 53.0     | Greece                  | 64.1              | Cyprus                  | 39.7                             | Cyprus             | 55.0 |
| Cyprus             | 45.8             | Iceland                         | 46.9                       | Latvia                       | 47.2     | Latvia                  | 63.3              | Latvia                  | 38.9                             | Portugal           | 55.0 |
| Iran               | 43.4             | England                         | 45.9                       | Romania                      | 45.8     | Spain                   | 62.2              | Portugal                | 38.2                             | Lithuania          | 54.6 |
| Philippines        | 38.0             | Cyprus                          | 43.5                       | Portugal                     | 43.2     | Romania                 | 57.5              | Romania                 | 38.0                             | USA                | 53.0 |
| Colombia           | 34.2             | Philippines                     | 42.2                       | Philippines                  | 35.7     | Philippines             | 49.2              | Philippines             | 30.9                             | Iran               | 44.2 |
| Kuwait             | 26.4             | Iran                            | 33.7                       | Iran                         | 35.3     | Colombia                | 47.6              | Colombia                | 28.7                             | Colombia           | 40.8 |
| South Africa       | 26.0             | Colombia                        | 31.9                       | Colombia                     | 33.8     | Iran                    | 46.3              | Kuwait                  | 27.0                             | Kuwait             | 35.7 |
|                    |                  | South Africa                    | 28.3                       | South Africa                 | 27.2     | Kuwait                  | 44.5              | South Africa            | 20.3                             | Philippines        | 32.1 |
|                    |                  | Kuwait                          | 27.5                       | Kuwait                       | 25.0     | South Africa            | 36.8              | Kuwait                  | 20.2                             | Colombia           | 11.9 |
|                    |                  |                                 |                            |                              |          |                         |                   | South Africa            | 27.3                             | South Africa       | 8.3  |
|                    |                  |                                 |                            |                              |          |                         |                   |                         |                                  | South Africa       | 28.1 |

Promedio Internacional

Promedio EEUU

# 1995 TIMSS Ciencias 4º Grado – Porcentaje de respuestas correctas

| Earth Features    | Earth Processes   | Earth in the Universe | Plants & Animals  | Organs & Tissues  | Life Processes & Functions | Life Cycles & Genetics | Interactions of Living Things |
|-------------------|-------------------|-----------------------|-------------------|-------------------|----------------------------|------------------------|-------------------------------|
| Korea 71          | Korea 67          | Czech Republic 75     | Korea 81          | Singapore 67      | Korea 75                   | Netherlands 77         | Netherlands 84                |
| Japan 63          | Japan 62          | Hong Kong 75          | Japan 78          | Australia 66      | Japan 75                   | Korea 75               | USA 83                        |
| USA 60            | USA 61            | Hungary 75            | Australia 72      | Czech Republic 65 | Netherlands 74             | Czech Republic 73      | Australia 82                  |
| England 59        | Netherlands 58    | Norway 75             | Czech Republic 72 | USA 65            | Australia 70               | Australia 71           | Korea 82                      |
| Canada 58         | Australia 56      | Korea 74              | Singapore 70      | Hong Kong 65      | Czech Republic 69          | Japan 71               | Japan 79                      |
| Czech Republic 58 | England 55        | Australia 72          | USA 70            | Korea 63          | England 69                 | USA 70                 | Canada 77                     |
| Hungary 58        | Canada 55         | Canada 71             | Netherlands 67    | Japan 63          | Singapore 69               | Canada 69              | Norway 76                     |
| Netherlands 57    | Singapore 54      | England 71            | Canada 67         | England 62        | USA 68                     | Norway 68              | England 76                    |
| Norway 56         | Czech Republic 54 | USA 70                | England 67        | New Zealand 61    | Norway 67                  | England 68             | Czech Republic 75             |
| Australia 56      | Hungary 53        | Netherlands 69        | New Zealand 67    | Canada 61         | Israel 67                  | Hong Kong 68           | Israel 75                     |
| New Zealand 54    | New Zealand 53    | Japan 69              | Hungary 66        | Hungary 61        | Canada 66                  | Hungary 67             | Singapore 75                  |
| Hong Kong 54      | International 50  | Singapore 69          | Hong Kong 65      | Netherlands 61    | Hong Kong 66               | Singapore 67           | New Zealand 74                |
| International 53  | Hong Kong 51      | International 67      | International 64  | Norway 61         | Hungary 64                 | New Zealand 66         | Hong Kong 74                  |
| Singapore 53      | Israel 48         | New Zealand 66        | Norway 60         | International 59  | International 64           | International 64       | International 72              |
| Israel 48         | Thailand 45       | Thailand 61           | Thailand 56       | Israel 57         | New Zealand 63             | Israel 62              | Hungary 66                    |
| Thailand 42       | Norway 42         | Israel 58             | Israel 55         | Thailand 55       | Thailand 48                | Thailand 53            | Thailand 53                   |

| Human Biology & Health | Matter            | Energy & Physical | Physical & Chemical | Forces & Motion   | Environmental & Resource | Scientific Processes |
|------------------------|-------------------|-------------------|---------------------|-------------------|--------------------------|----------------------|
| Netherlands 72         | Korea 77          | Korea 73          | Netherlands 74      | Korea 68          | Korea 74                 | Korea 66             |
| Korea 70               | Japan 75          | Japan 70          | Korea 72            | Japan 62          | Japan 72                 | USA 63               |
| Australia 70           | Netherlands 68    | Australia 63      | Japan 72            | Czech Republic 62 | Australia 69             | Australia 59         |
| USA 69                 | Singapore 67      | Netherlands 62    | Hong Kong 68        | Netherlands 61    | USA 68                   | Singapore 54         |
| Norway 68              | Australia 63      | England 62        | Czech Republic 67   | Singapore 60      | Netherlands 65           | England 54           |
| Singapore 68           | USA 61            | Canada 61         | USA 65              | Norway 58         | Czech Republic 63        | Japan 53             |
| England 67             | Canada 61         | Czech Republic 61 | Singapore 65        | Canada 56         | Hungary 62               | Netherlands 52       |
| Hong Kong 67           | Czech Republic 61 | USA 61            | Australia 63        | Australia 55      | Canada 61                | New Zealand 52       |
| Canada 66              | Hong Kong 60      | Singapore 61      | Canada 62           | Hungary 55        | England 60               | Hong Kong 51         |
| Czech Republic 66      | Hungary 59        | Hong Kong 59      | England 61          | Hong Kong 54      | New Zealand 59           | Czech Republic 51    |
| Japan 66               | England 58        | Israel 58         | Hungary 60          | USA 53            | International 58         | Canada 51            |
| Hungary 65             | International 58  | Hungary 57        | International 59    | New Zealand 52    | Norway 58                | Israel 50            |
| New Zealand 64         | New Zealand 58    | International 56  | Norway 58           | International 51  | Israel 58                | Norway 48            |
| International 63       | Norway 56         | New Zealand 56    | Israel 57           | England 49        | Singapore 57             | International 46     |
| Israel 62              | Israel 53         | Norway 53         | New Zealand 57      | Thailand 47       | Hong Kong 54             | Hungary 40           |
| Thailand 52            | Thailand 46       | Thailand 44       | Thailand 46         | Israel 46         | Thailand 53              | Thailand 40          |

# 1995 TIMSS Ciencias grado 8<sup>o</sup> – Porcentaje de respuestas correctas

| Earth Features               | Earth Processes              | Earth in the Universe        | Diversity & Structure of Living Things | Life Processes & Functions | Life Cycles & Genetics       | Interactions of Living Things | Human Biology & Health       | Properties & Classification of Matter |
|------------------------------|------------------------------|------------------------------|--|----------------------------|------------------------------|-------------------------------|------------------------------|---------------------------------------|
| Czech Republic 67            | England 67                   | Sweden 71                    | Japan 76                               | Singapore 72               | Czech Republic 82            | Korea 69                      | Singapore 74                 | Japan 67                              |
| Hungary 67                   | Singapore 67                 | Norway 70                    | Singapore 74                           | Japan 70                   | USA 81                       | Singapore 66                  | Czech Republic 72            | Singapore 67                          |
| Korea 65                     | Belgium (Fl) 65              | Netherlands 67               | Hong Kong 73                           | Korea 68                   | England 80                   | Japan 65                      | Netherlands 71               | Korea 65                              |
| Singapore 65                 | Netherlands 62               | Czech Republic 67            | Korea 72                               | Czech Republic 64          | Netherlands 79               | Thailand 64                   | Japan 69                     | Czech Republic 60                     |
| Belgium (Fl) 61              | Norway 62                    | Japan 67                     | Czech Republic 72                      | Thailand 63                | Israel 79                    | Hungary 63                    | Belgium (Fl) 69              | Netherlands 58                        |
| Sweden 61                    | USA 61                       | Thailand 66                  | Netherlands 72                         | Belgium (Fl) 63            | Belgium (Fl) 79              | Australia 62                  | Hungary 69                   | Belgium (Fl) 58                       |
| Thailand 60                  | <b>Russian Federation 61</b> | Singapore 65                 | Thailand 69                            | Netherlands 61             | Canada 78                    | England 62                    | England 68                   | Hungary 57                            |
| <b>Russian Federation 59</b> | Canada 61                    | Switzerland 65               | Sweden 68                              | Hungary 60                 | Sweden 78                    | Norway 60                     | Israel 68                    | Sweden 57                             |
| Norway 59                    | Sweden 60                    | Korea 64                     | Hungary 67                             | Hungary 60                 | Norway 78                    | Canada 58                     | Germany 68                   | Norway Kong 56                        |
| Japan 59                     | Korea 59                     | USA 63                       | Australia 67                           | England 59                 | Korea 76                     | Czech Republic 58             | USA 67                       | Canada 56                             |
| England 59                   | Japan 58                     | Germany 63                   | Germany 66                             | Germany 58                 | France 76                    | New Zealand 56                | Thailand 67                  | Norway 55                             |
| Switzerland 58               | New Zealand 57               | Spain 63                     | <b>Russian Federation 66</b>           | USA 58                     | <b>Russian Federation 76</b> | Netherlands 56                | Australia 66                 | Australia 55                          |
| Netherlands 58               | Czech Republic 57            | Australia 63                 | England 64                             | Australia 57               | Germany 75                   | USA 54                        | Korea 66                     | England 55                            |
| Australia 57                 | Australia 57                 | Belgium (Fl) 62              | USA 64                                 | Canada 57                  | Switzerland 75               | Germany 53                    | Canada 65                    | Germany 55                            |
| Germany 57                   | Thailand 56                  | New Zealand 62               | Canada 63                              | Israel 57                  | Japan 75                     | Belgium (Fl) 53               | Sweden 64                    | <b>Russian Federation 54</b>          |
| USA 57                       | Switzerland 56               | Canada 61                    | Belgium (Fl) 63                        | Hong Kong 56               | New Zealand 74               | Spain 53                      | New Zealand 64               | New Zealand 54                        |
| Canada 57                    | Spain 55                     | England 59                   | New Zealand 62                         | New Zealand 56             | Hungary 74                   | <b>Russian Federation 52</b>  | Spain 63                     | Israel 53                             |
| Israel 56                    | France 55                    | Hungary 59                   | Spain 61                               | Spain 56                   | Australia 73                 | Sweden 52                     | <b>Russian Federation 63</b> | France 52                             |
| Spain 56                     | Israel 55                    | International 58             | International 61                       | Sweden 55                  | Spain 71                     | International 51              | Norway 63                    | International 52                      |
| New Zealand 56               | Germany 54                   | Hong Kong 58                 | Switzerland 61                         | International 55           | International 70             | Israel 50                     | Switzerland 61               | Switzerland 51                        |
| International 55             | International 54             | Israel 56                    | Israel 60                              | Switzerland 54             | Singapore 69                 | Switzerland 50                | International 61             | USA 50                                |
| France 55                    | Hong Kong 52                 | <b>Russian Federation 57</b> | Norway 59                              | Norway 54                  | Thailand 67                  | Hong Kong 47                  | Hong Kong 60                 | Spain 50                              |
| Hong Kong 54                 | Hungary 51                   | France 53                    | France 58                              | France 54                  | Hong Kong 65                 | France 45                     | France 56                    | Thailand 47                           |

| Structure of Matter          | Energy & Physical Processes  | Physical Changes             | Chemical Changes             | Forces & Motion              | Science, Technology, & Society | Environmental & Resource Issues | Scientific Processes         |
|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|--------------------------------|---------------------------------|------------------------------|
| <b>Russian Federation 56</b> | Singapore 71                 | Japan 67                     | Singapore 74                 | Czech Republic 78            | Korea 74                       | Singapore 73                    | Singapore 75                 |
| Hungary 54                   | Japan 69                     | Singapore 63                 | Korea 66                     | Japan 74                     | Hungary 73                     | Thailand 70                     | Korea 64                     |
| Czech Republic 54            | Korea 67                     | Czech Republic 63            | Hungary 65                   | Singapore 73                 | Netherlands 67                 | England 67                      | Netherlands 65               |
| Singapore 53                 | England 64                   | France 62                    | Czech Republic 64            | Netherlands 71               | Sweden 67                      | Australia 65                    | France 62                    |
| Spain 51                     | Netherlands 64               | Israel 61                    | England 64                   | Korea 70                     | Singapore 66                   | Netherlands 65                  | Czech Republic 61            |
| USA 48                       | Czech Republic 62            | Sweden 61                    | Japan 64                     | Hong Kong 69                 | Belgium (Fl) 65                | Korea 63                        | Australia 61                 |
| Israel 45                    | Belgium (Fl) 62              | Netherlands 61               | Australia 62                 | Switzerland 69               | New Zealand 60                 | Japan 62                        | Japan 60                     |
| Sweden 43                    | Australia 61                 | Hungary 61                   | <b>Russian Federation 62</b> | Hungary 69                   | Hungary 60                     | Canada 61                       | England 60                   |
| Korea 42                     | Hungary 60                   | Norway 60                    | USA 61                       | England 68                   | Thailand 59                    | New Zealand 61                  | Canada 59                    |
| Japan 41                     | New Zealand 60               | England 59                   | Germany 61                   | Sweden 68                    | England 57                     | USA 60                          | USA 59                       |
| Hong Kong 40                 | Canada 60                    | Belgium (Fl) 59              | Israel 61                    | Australia 67                 | Hong Kong 55                   | Belgium (Fl) 60                 | Hungary 57                   |
| International 40             | Hong Kong 60                 | Canada 59                    | Canada 60                    | Norway 67                    | Canada 53                      | Czech Republic 59               | Hong Kong 57                 |
| Australia 39                 | Israel 59                    | Korea 57                     | New Zealand 59               | Canada 66                    | Switzerland 53                 | Spain 59                        | Belgium (Fl) 57              |
| England 38                   | Germany 59                   | Australia 57                 | Hong Kong 58                 | Germany 67                   | Norway 52                      | Norway 58                       | New Zealand 57               |
| Canada 37                    | Switzerland 59               | <b>Russian Federation 57</b> | Spain 58                     | New Zealand 66               | Czech Republic 52              | Hong Kong 53                    | Thailand 55                  |
| Germany 35                   | <b>Russian Federation 58</b> | Switzerland 54               | Netherlands 58               | Belgium (Fl) 65              | Australia 52                   | International 53                | Germany 53                   |
| New Zealand 35               | USA 57                       | Germany 54                   | Sweden 57                    | France 64                    | Israel 51                      | Sweden 52                       | Israel 52                    |
| Norway 32                    | Norway 57                    | Thailand 53                  | International 56             | Spain 63                     | International 48               | Israel 52                       | Switzerland 53               |
| Thailand 31                  | Sweden 57                    | Spain 53                     | Belgium (Fl) 56              | <b>Russian Federation 62</b> | USA 48                         | Switzerland 50                  | International 53             |
| Netherlands 30               | International 56             | International 53             | Switzerland 55               | USA 61                       | Germany 47                     | Germany 50                      | Sweden 52                    |
| France 29                    | Thailand 55                  | New Zealand 53               | Norway 53                    | International 61             | Spain 44                       | Hungary 49                      | Norway 52                    |
| Switzerland 29               | Spain 55                     | USA 49                       | France 53                    | Israel 55                    | France 43                      | France 49                       | <b>Russian Federation 51</b> |
| Belgium (Fl) 27              | France 55                    | Hong Kong 49                 | Thailand 51                  | Thailand 56                  | <b>Russian Federation 40</b>   | <b>Russian Federation 47</b>    | Spain 50                     |



# Desempeño en tópicos específicos en matemáticas 1995 TIMSS

| Whole Numbers             | Common Fractions          | Decimal Fractions & Percentages | Relationships of Fractions | Estimations of Quantity/Size | Rounding                  | Estimating Computations   | Measurement Units         | Perimeter, Area, Volume   | Measurement Estimations & Errors |
|---------------------------|---------------------------|---------------------------------|----------------------------|------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|----------------------------------|
| Singapore 80.4            | Singapore 82.4            | Singapore 77.9                  | Singapore 85.1             | Japan 77.9                   | Czech Republic 86.9       | Singapore 75.8            | Singapore 77.9            | Singapore 84.5            | Czech Republic 82.9              |
| Japan 72.0                | Japan 72.2                | Czech Republic 72.5             | Korea 77.6                 | Singapore 77.3               | Singapore 86.6            | Czech Republic 69.8       | Japan 74.8                | Japan 72.6                | Japan 81.0                       |
| Switzerland 70.2          | Korea 69.9                | Hong Kong 71.1                  | Japan 75.3                 | England 72.2                 | Canada 84.7               | Japan 69.0                | Czech Republic 73.2       | Hong Kong 63.9            | Sweden 80.8                      |
| Belgium (Fl) 68.6         | Hong Kong 69.4            | Japan 69.8                      | Hong Kong 74.1             | Hong Kong 71.8               | Korea 83.8                | Korea 66.7                | Slovenia 72.0             | Korea 61.8                | Korea 79.5                       |
| Austria 68.4              | Belgium (Fl) 68.7         | Slovak Republic 69.1            | Belgium (Fl) 71.3          | Switzerland 71.8             | Iceland 83.1              | Belgium (Fl) 64.1         | Slovak Republic 71.9      | Austria 50.4              | Belgium (Fl) 78.9                |
| Korea 67.6                | Switzerland 62.4          | Hungary 68.7                    | Switzerland 70.0           | Czech Republic 71.7          | Slovak Republic 82.4      | Switzerland 71.8          | Belgium (Fl) 71.8         | Czech Republic 48.9       | Hungary 78.2                     |
| Czech Republic 67.4       | Ireland 61.7              | Korea 68.4                      | France 67.2                | Netherlands 71.2             | Belgium (Fl) 81.0         | Canada 61.3               | Switzerland 71.6          | Slovak Republic 47.9      | Switzerland 78.2                 |
| Hong Kong 65.4            | Austria 60.4              | Austria 66.6                    | Austria 66.8               | Belgium (Fl) 70.7            | Hungary 79.8              | Slovak Republic 61.1      | Sweden 69.5               | Switzerland 46.6          | Austria 77.7                     |
| Slovak Republic 64.6      | Belgium (Fr) 59.8         | Russian Federation 65.9         | Belgium (Fr) 65.8          | Korea 70.7                   | Japan 79.6                | Ireland 60.5              | France 69.0               | Slovenia 45.8             | Netherlands 76.1                 |
| France 64.5               | Slovenia 59.7             | France 64.9                     | Canada 65.1                | Austria 69.9                 | USA 79.2                  | Sweden 60.0               | Austria 68.1              | Belgium (Fl) 45.6         | France 75.2                      |
| Slovenia 63.4             | Czech Republic 59.6       | Belgium (Fl) 64.9               | Czech Republic 65.1        | Australia 69.3               | Netherlands 78.5          | Australia 59.1            | Belgium (Fr) 68.1         | Bulgaria 45.2             | Slovak Republic 75.2             |
| Russian Federation 62.7   | Netherlands 58.9          | Slovenia 62.9                   | Ireland 64.3               | Hungary 69.3                 | Sweden 78.5               | Austria 58.9              | Ireland 68.1              | Russian Federation 44.6   | Australia 74.5                   |
| Bulgaria 62.5             | Slovak Republic 58.6      | Switzerland 61.9                | Slovak Republic 63.0       | Sweden 69.3                  | Australia 77.5            | Netherlands 58.7          | Bulgaria 68.0             | France 44.1               | Norway 74.5                      |
| Ireland 62.2              | France 57.8               | Canada 61.0                     | Germany 62.6               | Slovak Republic 69.1         | Switzerland 77.4          | Hong Kong 57.8            | Korea 67.9                | Netherlands 44.0          | Denmark 73.0                     |
| Spain 60.8                | Hungary 57.7              | Sweden 59.2                     | Netherlands 62.5           | France 69.0                  | Ireland 76.5              | New Zealand 57.6          | Hungary 67.5              | Belgium (Fr) 43.0         | Germany 72.9                     |
| Hungary 60.6              | Israel 57.4               | Belgium (Fr) 58.6               | Austria 62.4               | Germany 69.0                 | Austria 75.9              | Austria 57.3              | Netherlands 66.8          | Hungary 42.9              | Hong Kong 72.7                   |
| Sweden 58.9               | Canada 56.2               | Thailand 58.0                   | Sweden 62.2                | Canada 67.8                  | Thailand 75.4             | Norway 57.0               | Norway 66.4               | Australia 42.1            | Japan 72.5                       |
| Canada 57.9               | Russian Federation 55.8   | Netherlands 57.8                | Australia 61.0             | Scotland 68.8                | France 74.7               | USA 55.7                  | Russian Federation 65.9   | Canada 40.4               | Slovenia 72.5                    |
| Israel 59.0               | Australia 55.4            | Bulgaria 57.8                   | Norway 60.7                | Hungary 66.6                 | Slovenia 74.7             | Iceland 54.7              | Denmark 65.4              | Thailand 40.0             | England 71.8                     |
| Thailand 56.0             | Thailand 54.2             | Ireland 57.3                    | Bulgaria 59.9              | Belgium (Fr) 65.8            | New Zealand 74.4          | England 54.4              | Hong Kong 65.2            | Ireland 39.4              | New Zealand 70.6                 |
| <b>International 55.7</b> | Bulgaria 54.2             | Germany 57.2                    | Thailand 59.6              | Slovenia 65.5                | Hong Kong 74.2            | Slovenia 52.6             | Australia 65.0            | Sweden 39.3               | Scotland 69.9                    |
| Germany 55.4              | Sweden 53.1               | Israel 56.3                     | Norway 59.6                | New Zealand 65.3             | Russian Federation 73.5   | Germany 52.0              | Germany 63.5              | <b>International 39.0</b> | Canada 69.7                      |
| Latvia 55.4               | <b>International 52.3</b> | USA 55.8                        | Russian Federation 59.2    | Ireland 64.4                 | England 74.2              | Israel 51.9               | Iceland 63.0              | Romania 38.2              | Ireland 69.6                     |
| Belgium (Fr) 55.4         | Cyprus 51.9               | <b>International 55.5</b>       | Iceland 59.2               | Denmark 64.3                 | Scotland 73.4             | Scotland 51.6             | Canada 63.0               | England 37.1              | Russian Federation 69.6          |
| Australia 55.0            | Germany 51.7              | Lithuania 55.4                  | USA 58.5                   | Russian Federation 63.5      | Norway 72.3               | France 50.8               | Israel 63.0               | Cyprus 36.9               | Latvia 66.9                      |
| Lithuania 53.8            | New Zealand 51.5          | Norway 54.1                     | Israel 57.6                | USA 62.7                     | Denmark 71.2              | Belgium (Fr) 50.6         | Spain 62.4                | Israel 36.9               | Thailand 66.1                    |
| Netherlands 53.5          | Norway 51.2               | Australia 53.5                  | <b>International 57.0</b>  | Bulgaria 62.4                | <b>International 70.9</b> | Russian Federation 50.0   | Thailand 62.3             | Norway 36.4               | <b>International 64.8</b>        |
| Norway 53.4               | USA 49.3                  | Latvia 52.9                     | New Zealand 56.8           | Iceland 61.6                 | Belgium (Fr) 70.2         | Thailand 49.5             | <b>International 61.6</b> | Scotland 35.7             | Belgium (Fr) 64.6                |
| Greece 52.7               | Scotland 49.3             | Iceland 52.6                    | England 53.8               | <b>International 61.1</b>    | Germany 69.9              | <b>International 50.9</b> | New Zealand 61.3          | Denmark 35.5              | Israel 63.3                      |
| USA 52.3                  | England 49.2              | Greece 52.6                     | Denmark 51.9               | Latvia 59.5                  | Lithuania 69.2            | Greece 46.3               | England 60.5              | New Zealand 35.0          | USA 62.5                         |
| Romania 52.3              | Spain 49.2                | Spain 50.6                      | Scotland 51.5              | Israel 58.4                  | Israel 68.8               | Denmark 46.0              | Latvia 60.3               | Latvia 33.6               | Iceland 61.6                     |
| Denmark 51.0              | Denmark 49.0              | Portugal 49.9                   | Greece 51.3                | Bulgaria 57.1                | Bulgaria 68.1             | Spain 59.3                | Romania 59.3              | Iceland 33.1              | Greece 59.4                      |
| Portugal 49.0             | Latvia 47.3               | New Zealand 49.3                | Cyprus 50.9                | Spain 54.8                   | Portugal 65.0             | Spain 44.1                | Greece 58.4               | Germany 32.9              | Spain 55.3                       |
| New Zealand 48.6          | Greece 47.3               | Denmark 48.8                    | Lithuania 49.0             | Greece 54.5                  | Cyprus 64.4               | Lithuania 42.3            | Scotland 58.5             | Lithuania 32.2            | Lithuania 55.1                   |
| Iceland 48.4              | Romania 47.0              | Scotland 47.3                   | Spain 48.2                 | Lithuania 53.0               | Greece 64.1               | Cyprus 39.7               | Cyprus 55.0               | Spain 29.9                | Portugal 54.9                    |
| Scotland 47.9             | Iceland 44.4              | Romania 46.9                    | Latvia 47.2                | Portugal 50.7                | Latvia 63.3               | Latvia 38.9               | Portugal 55.0             | Greece 29.8               | Bulgaria 52.8                    |
| England 46.8              | Lithuania 39.1            | England 45.9                    | Romania 45.8               | Romania 45.8                 | Spain 62.2                | Portugal 38.2             | Lithuania 54.6            | USA 27.8                  | Romania 50.0                     |
| Cyprus 45.8               | Cyprus 37.9               | Cyprus 43.5                     | Portugal 43.2              | Cyprus 43.9                  | Romania 57.5              | Romania 38.0              | USA 53.0                  | Portugal 22.8             | Cyprus 45.7                      |
| Iran 43.4                 | Portugal 34.8             | Philippines 42.2                | Philippines 35.7           | Philippines 36.9             | Philippines 49.2          | Philippines 30.9          | Iran 44.2                 | Iran 21.1                 | Philippines 36.0                 |
| Philippines 38.0          | Philippines 30.0          | Iran 33.7                       | Iran 35.3                  | Kuwait 34.7                  | <b>Colombia 47.6</b>      | <b>Colombia 28.7</b>      | <b>Colombia 40.8</b>      | Kuwait 14.7               | Iran 35.5                        |
| <b>Colombia 34.2</b>      | <b>Colombia 27.3</b>      | <b>Colombia 31.9</b>            | <b>Colombia 27.3</b>       | <b>Colombia 33.8</b>         | Iran 46.3                 | Iran 27.0                 | Kuwait 35.7               | Philippines 14.4          | Kuwait 35.1                      |
| Kuwait 26.4               | Kuwait 25.2               | South Africa 28.3               | South Africa 27.2          | Iran 33.4                    | Kuwait 44.5               | South Africa 20.3         | Philippines 32.1          | <b>Colombia 11.9</b>      | <b>Colombia 32.4</b>             |
| South Africa 26.0         | South Africa 20.2         | Kuwait 27.5                     | Kuwait 25.0                | South Africa 28.6            | South Africa 36.8         | Kuwait 20.2               | South Africa 27.3         | South Africa 8.3          | South Africa 28.1                |

Promedio Internacional

Promedio COLOMBIA

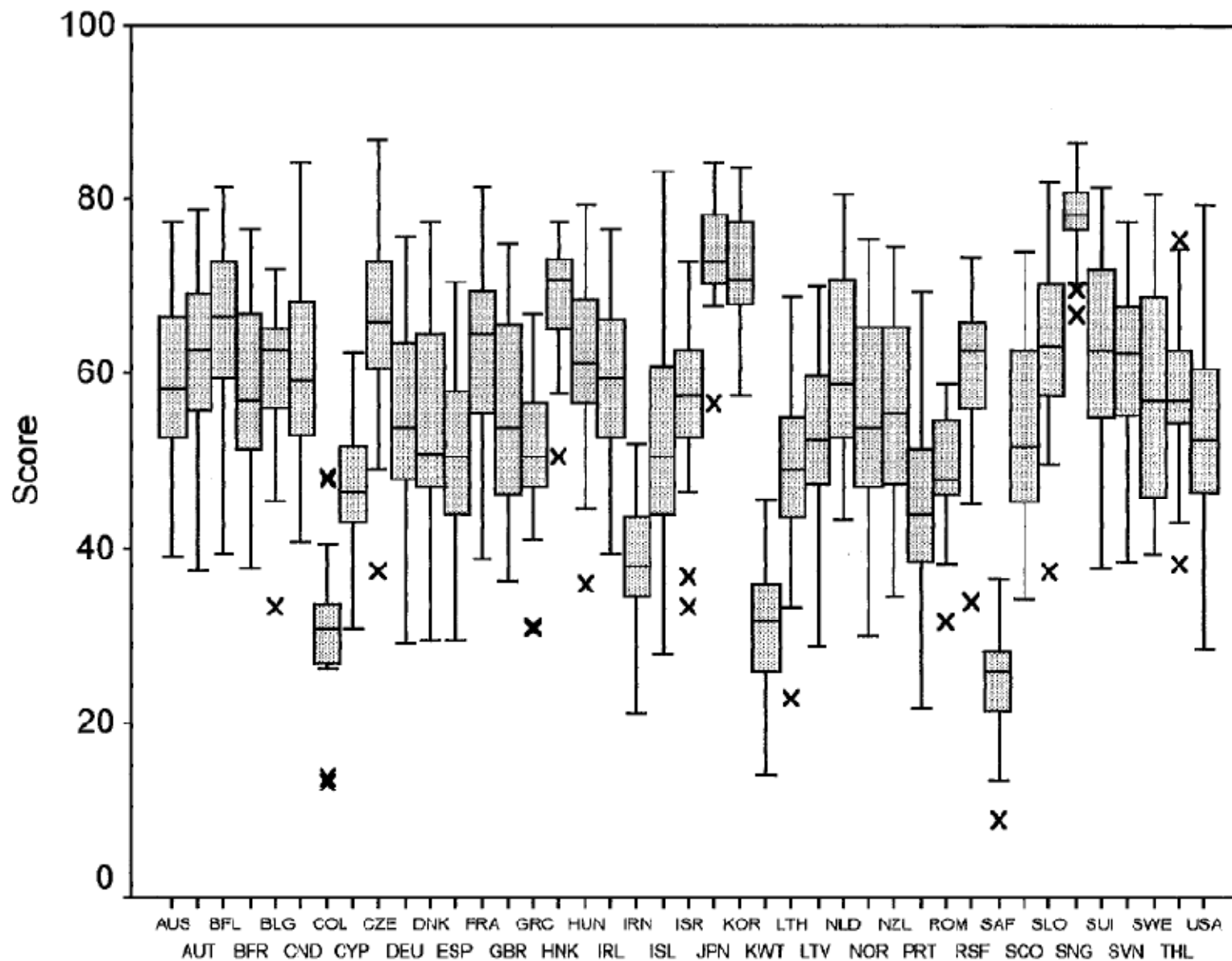
# Desempeño en tópicos específicos en matemáticas 1995 TIMSS

| 2D Geo. Basics          | Polygons & Circles      | 3D Geo. & Transformations | Congruence & Similarity | Proportionality Concepts | Proportionality Problems | Patterns, Relations & Functions | Equations & Formulas    | Data Representation & Analysis | Statistics & Probability |
|-------------------------|-------------------------|---------------------------|-------------------------|--------------------------|--------------------------|---------------------------------|-------------------------|--------------------------------|--------------------------|
| Japan 78.9              | Korea 73.0              | Japan 84.3                | Japan 79.7              | Singapore 70.1           | Singapore 76.7           | Japan 70.0                      | Singapore 79.8          | Japan 84.3                     | Singapore 78.5           |
| Singapore 78.3          | Japan 70.8              | Singapore 78.6            | Korea 76.9              | Korea 57.0               | Japan 67.8               | Korea 68.4                      | Japan 72.3              | Korea 81.9                     | Korea 77.8               |
| Korea 75.5              | Singapore 70.6          | Czech Republic 77.7       | Singapore 76.7          | Japan 56.9               | Korea 65.1               | Singapore 67.2                  | Hong Kong 70.5          | France 81.4                    | Belgium (Fl) 77.7        |
| Hong Kong 73.5          | Hong Kong 65.4          | France 77.7               | Hong Kong 71.0          | Hong Kong 50.1           | Hong Kong 64.0           | Hong Kong 60.8                  | Korea 70.0              | Switzerland 81.3               | Japan 75.0               |
| Russian Federation 63.4 | Belgium (Fl) 64.1       | Hong Kong 77.6            | France 69.7             | Netherlands 41.9         | Czech Republic 61.3      | Czech Republic 60.2             | Czech Republic 64.3     | Singapore 81.0                 | Hong Kong 73.0           |
| Netherlands 62.9        | Bulgaria 63.4           | Switzerland 75.9          | Czech Republic 66.1     | Ireland 41.2             | Belgium (Fl) 59.4        | England 60.1                    | Belgium (Fl) 62.1       | Netherlands 80.6               | Netherlands 72.4         |
| Thailand 62.4           | France 61.9             | Slovak Republic 75.2      | Bulgaria 66.0           | Canada 40.3              | Slovak Republic 58.7     | Switzerland 59.5                | Russian Federation 61.4 | Czech Republic 79.6            | Switzerland 72.4         |
| Czech Republic 62.1     | Israel 59.7             | Belgium (Fr) 74.5         | Slovak Republic 63.2    | Sweden 39.2              | Bulgaria 58.3            | Belgium (Fl) 59.2               | Hungary 60.9            | Ireland 79.5                   | Ireland 70.3             |
| Bulgaria 61.7           | Czech Republic 57.4     | Belgium (Fl) 73.7         | Thailand 62.7           | Belgium (Fl) 39.0        | Switzerland 57.3         | Hungary 59.1                    | Slovak Republic 60.6    | Belgium (Fl) 79.5              | Canada 70.0              |
| Hungary 61.6            | Romania 57.3            | Korea 73.3                | Russian Federation 62.3 | Slovenia 38.1            | Russian Federation 56.3  | Canada 58.2                     | Slovenia 60.1           | Austria 78.7                   | Sweden 68.7              |
| Slovak Republic 59.8    | Russian Federation 57.2 | Bulgaria 72.6             | Belgium (Fl) 57.5       | Australia 37.8           | Thailand 56.0            | Australia 57.6                  | Bulgaria 59.4           | Denmark 77.6                   | Belgium (Fr) 68.5        |
| Australia 58.8          | Belgium (Fr) 54.2       | Hungary 71.0              | Latvia 56.9             | France 37.3              | Hungary 55.9             | Austria 56.3                    | Israel 58.3             | Slovenia 77.5                  | Australia 67.5           |
| Belgium (Fl) 58.8       | Thailand 53.5           | Netherlands 70.6          | Slovenia 56.6           | Switzerland 36.8         | Netherlands 55.9         | Netherlands 56.9                | Austria 58.2            | Belgium (Fr) 76.8              | France 66.5              |
| Slovenia 58.3           | Slovak Republic 53.2    | Slovenia 70.2             | Romania 56.1            | Czech Republic 37.3      | Belgium (Fr) 55.9        | Scotland 56.5                   | Thailand 54.0           | Hong Kong 76.4                 | Hungary 66.2             |
| Austria 58.1            | Slovenia 53.2           | Russian Federation 70.2   | Israel 54.8             | Austria 36.5             | France 55.7              | New Zealand 55.7                | France 53.6             | Ireland 76.2                   | New Zealand 65.9         |
| Switzerland 57.9        | Hungary 51.6            | Canada 70.1               | Thailand 53.8           | Thailand 36.5            | Slovenia 55.3            | Slovenia 55.5                   | Belgium (Fr) 52.8       | Germany 76.0                   | England 65.3             |
| France 56.1             | Canada 50.5             | Austria 69.5              | Hungary 53.4            | Belgium (Fr) 36.1        | Austria 55.2             | Slovenia 55.4                   | Australia 52.8          | Norway 75.5                    | Norway 64.7              |
| New Zealand 55.8        | Australia 50.4          | New Zealand 67.3          | Canada 52.8             | Slovak Republic 35.9     | Ireland 52.4             | France 55.0                     | Ireland 52.7            | Slovak Republic 75.2           | Austria 64.6             |
| England 54.9            | Greece 49.6             | Latvia 66.6               | International 52.5      | England 34.8             | Australia 52.2           | Slovak Republic 54.3            | Canada 52.4             | Australia 75.2                 | Slovenia 63.7            |
| Canada 54.7             | Latvia 49.1             | England 66.3              | Belgium (Fr) 51.9       | Hungary 34.6             | Canada 51.6              | Bulgaria 53.7                   | Spain 52.2              | Canada 75.0                    | Czech Republic 63.4      |
| International 53.7      | International 48.9      | Australia 65.5            | Switzerland 51.2        | International 33.6       | International 50.2       | Thailand 53.4                   | Switzerland 51.9        | England 74.8                   | USA 63.1                 |
| Denmark 53.9            | Austria 48.7            | Denmark 65.4              | Cyprus 51.1             | Russian Federation 33.5  | Sweden 49.2              | Russian Federation 53.2         | Netherlands 51.7        | Thailand 74.5                  | Scotland 62.4            |
| Latvia 53.3             | Switzerland 48.6        | International 63.4        | Australia 50.9          | New Zealand 33.4         | Germany 49.0             | Israel 53.2                     | International 50.7      | Scotland 74.2                  | Germany 62.4             |
| Scotland 52.6           | Ireland 48.0            | Israel 64.8               | Denmark 50.3            | Scotland 32.4            | Latvia 48.2              | International 51.5              | Romania 50.5            | New Zealand 74.1               | Israel 62.3              |
| Israel 52.5             | England 47.0            | Thailand 64.5             | Netherlands 51.0        | USA 31.5                 | Denmark 47.7             | USA 51.1                        | USA 49.4                | Hungary 73.7                   | Iceland 62.0             |
| Ireland 52.4            | Cyprus 46.7             | Germany 63.7              | Austria 48.9            | Israel 31.4              | England 47.2             | Spain 50.3                      | Latvia 49.1             | Israel 73.2                    | Denmark 61.9             |
| Norway 52.1             | Lithuania 44.6          | Lithuania 63.7            | Iceland 48.5            | Romania 31.3             | New Zealand 47.1         | Belgium (Fr) 49.9               | Cyprus 46.7             | Iceland 72.6                   | Bulgaria 61.1            |
| Belgium (Fr) 51.4       | Iceland 44.3            | Scotland 63.2             | Greece 48.2             | Norway 30.9              | Norway 47.1              | Norway 48.7                     | New Zealand 46.6        | USA 72.6                       | International 59.9       |
| Spain 49.5              | Germany 44.3            | Iceland 60.4              | Norway 46.9             | Bulgaria 30.6            | Denmark 46.7             | Denmark 48.6                    | Germany 46.4            | Russian Federation 72.0        | Spain 58.0               |
| Germany 49.3            | Netherlands 44.0        | Greece 58.8               | Ireland 46.7            | Greece 29.6              | Israel 46.5              | Germany 47.6                    | Greece 45.6             | International 71.0             | Russian Federation 56.9  |
| Lithuania 48.9          | New Zealand 43.2        | Norway 58.6               | New Zealand 45.9        | Cyprus 29.5              | Lithuania 45.6           | Sweden 47.2                     | Lithuania 45.3          | Bulgaria 70.8                  | Cyprus 57.2              |
| Iceland 48.7            | Scotland 42.8           | USA 58.4                  | Iceland 45.9            | Iceland 29.4             | Scotland 45.4            | Latvia 47.2                     | Latvia 44.9             | Spain 70.4                     | Slovak Republic 57.0     |
| Greece 48.6             | Sweden 42.8             | Spain 58.2                | Scotland 45.6           | Denmark 28.8             | USA 45.2                 | Greece 46.9                     | England 44.1            | Latvia 70.0                    | Thailand 56.5            |
| USA 47.9                | Norway 42.4             | Ireland 57.8              | England 45.6            | Spain 27.4               | Iceland 44.6             | Iceland 44.7                    | Denmark 44.0            | Portugal 69.7                  | Greece 52.6              |
| Romania 47.5            | Denmark 40.1            | Sweden 55.9               | Germany 45.1            | Latvia 27.3              | Spain 43.6               | Romania 45.4                    | Sweden 43.7             | Lithuania 67.0                 | Latvia 51.6              |
| Sweden 46.1             | Spain 39.3              | Portugal 51.9             | Iran 44.1               | Germany 26.5             | Cyprus 43.3              | Portugal 45.3                   | Scotland 42.5           | Greece 66.6                    | Romania 46.7             |
| Cyprus 43.8             | USA 39.1                | Romania 50.7              | USA 44.1                | Iran 22.9                | Greece 41.1              | Lithuania 45.2                  | Iceland 39.5            | Cyprus 59.6                    | Portugal 44.5            |
| Portugal 42.8           | Iran 37.9               | Cyprus 49.9               | Spain 43.6              | Lithuania 21.8           | Portugal 41.0            | Cyprus 42.3                     | Portugal 36.6           | Romania 58.0                   | Lithuania 43.6           |
| Iran 41.8               | Portugal 35.5           | Iran 47.3                 | Portugal 43.2           | Portugal 20.3            | Iran 38.0                | Iran 41.7                       | Iran 35.6               | Iran 52.0                      | Iran 36.4                |
| Kuwait 35.4             | Kuwait 31.3             | Kuwait 44.2               | Kuwait 38.2             | Philippines 17.1         | Philippines 32.8         | Colombia 33.2                   | Kuwait 29.5             | Colombia 47.7                  | Kuwait 34.8              |
| Philippines 32.1        | Colombia 27.8           | Philippines 36.5          | Philippines 31.4        | Kuwait 13.7              | Colombia 29.8            | Philippines 33.1                | Philippines 29.4        | Philippines 45.9               | Philippines 32.6         |
| Colombia 27.0           | Philippines 27.3        | Colombia 36.4             | Colombia 26.5           | Colombia 13.0            | Colombia 29.5            | Kuwait 32.6                     | Colombia 24.5           | Kuwait 45.8                    | Colombia 31.3            |
| South Africa 25.7       | South Africa 21.7       | South Africa 26.1         | South Africa 23.2       | South Africa 11.9        | South Africa 27.0        | South Africa 20.4               | South Africa 22.9       | South Africa 29.4              | South Africa 28.1        |

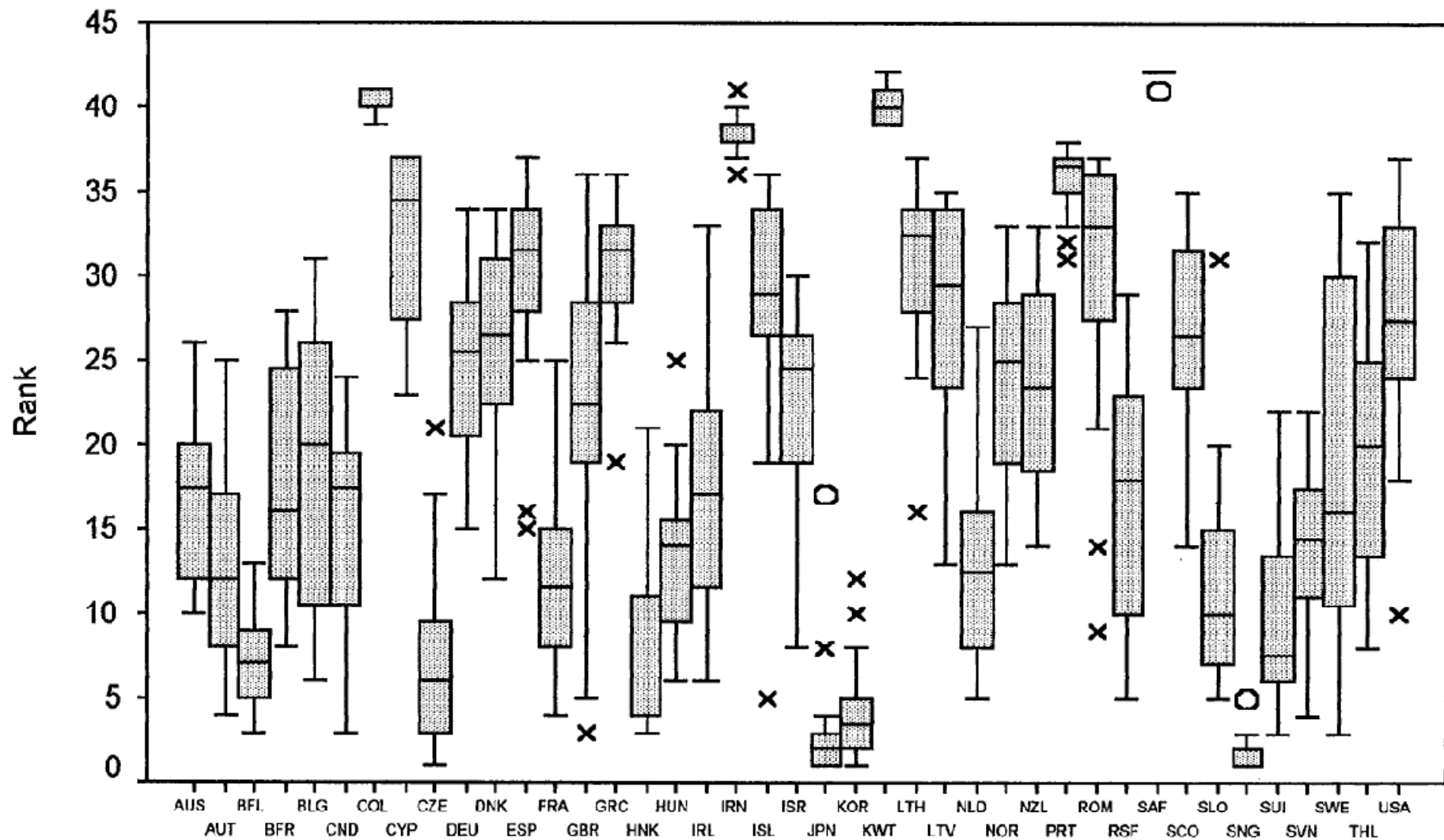
Promedio Internacional

Promedio COLOMBIA

# Distribución de los resultados en matemáticas 8º grado por país



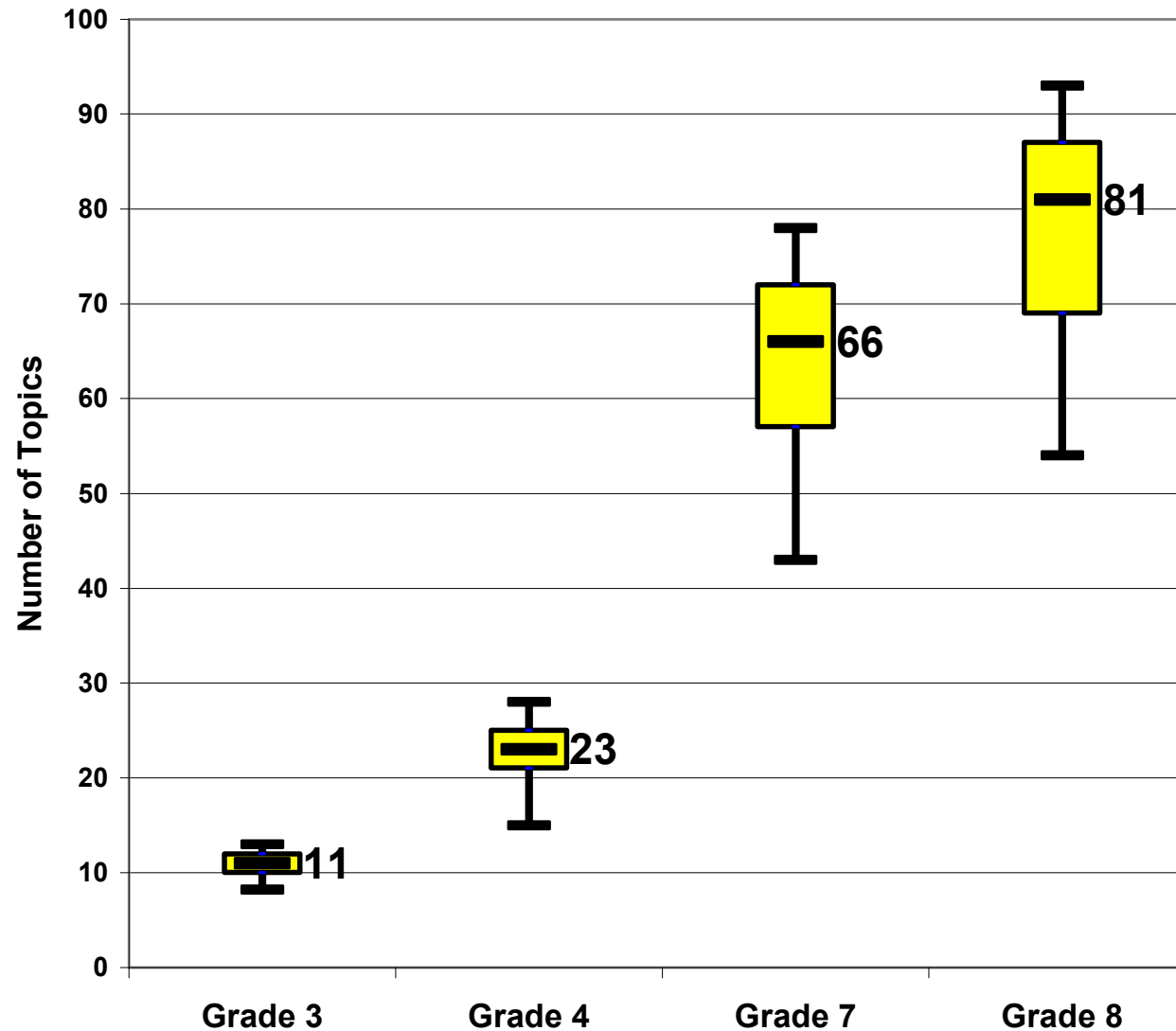
# Distribución de los ranks de los países en matemáticas 8º grado



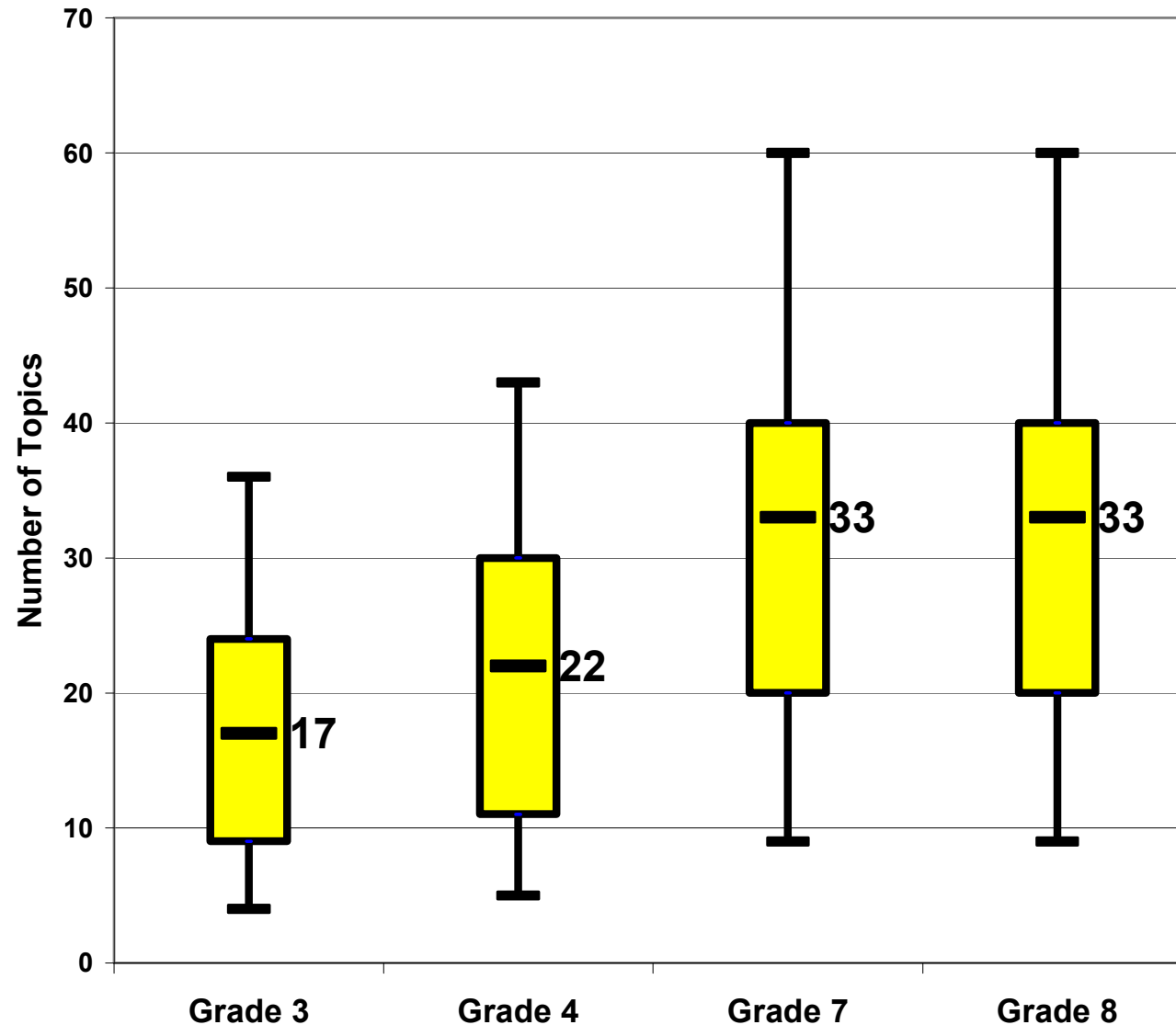
# Alineación con escenario ideal

| Países                | Número de tópicos en currículo | Número de tópicos desalineados | Número de tópicos alineados | Número de tópicos desalineados<br>2 |
|-----------------------|--------------------------------|--------------------------------|-----------------------------|-------------------------------------|
| <b>Argentina</b>      | <b>81</b>                      | <b>3</b>                       | <b>54</b>                   | <b>24</b>                           |
| <b>Australia</b>      | <b>136</b>                     | <b>32</b>                      | <b>75</b>                   | <b>29</b>                           |
| <b>Belgium (Fl)</b>   | <b>155</b>                     | <b>37</b>                      | <b>87</b>                   | <b>31</b>                           |
| <b>Canada</b>         | <b>181</b>                     | <b>58</b>                      | <b>92</b>                   | <b>31</b>                           |
| <b>Cyprus</b>         | <b>162</b>                     | <b>49</b>                      | <b>87</b>                   | <b>26</b>                           |
| <b>Czech Republic</b> | <b>119</b>                     | <b>32</b>                      | <b>83</b>                   | <b>4</b>                            |
| <b>France</b>         | <b>156</b>                     | <b>40</b>                      | <b>85</b>                   | <b>31</b>                           |
| <b>Germany</b>        | <b>117</b>                     | <b>33</b>                      | <b>74</b>                   | <b>10</b>                           |
| <b>Hong Kong</b>      | <b>79</b>                      | <b>9</b>                       | <b>62</b>                   | <b>8</b>                            |
| <b>Hungary</b>        | <b>158</b>                     | <b>49</b>                      | <b>93</b>                   | <b>16</b>                           |
| <b>Iceland</b>        | <b>137</b>                     | <b>32</b>                      | <b>81</b>                   | <b>24</b>                           |
| <b>Japan</b>          | <b>128</b>                     | <b>39</b>                      | <b>86</b>                   | <b>3</b>                            |
| <b>Korea</b>          | <b>125</b>                     | <b>27</b>                      | <b>90</b>                   | <b>8</b>                            |
| <b>Netherlands</b>    | <b>97</b>                      | <b>14</b>                      | <b>54</b>                   | <b>29</b>                           |
| <b>Norway</b>         | <b>159</b>                     | <b>33</b>                      | <b>96</b>                   | <b>30</b>                           |
| <b>Portugal</b>       | <b>144</b>                     | <b>48</b>                      | <b>84</b>                   | <b>12</b>                           |
| <b>Singapore</b>      | <b>115</b>                     | <b>11</b>                      | <b>84</b>                   | <b>21</b>                           |
| <b>Spain</b>          | <b>109</b>                     | <b>23</b>                      | <b>69</b>                   | <b>17</b>                           |
| <b>USA</b>            | <b>186</b>                     | <b>63</b>                      | <b>98</b>                   | <b>25</b>                           |

# Número de tópicos alineados con escenario ideal



# Número de tópicos no alineados (Introducidos antes del escenario ideal)



# Análisis de regresión de logro contra coherencia y medida de foco

| <i>Model</i>  | <i>Grade 3</i>                  | <i>Grade 4</i>                  | <i>Grade 7</i>                  | <i>Grade 8</i>                  |
|---|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| <i>Predictor</i>                                    | <b>Estimate ( StdError, p )</b> | <b>Estimate ( StdError, p )</b> | <b>Estimate ( StdError, p )</b> | <b>Estimate ( StdError, p )</b> |
| <i>Number of Topics Aligned with Ideal Scenario</i> | <b>9.94</b> ( 7.38 , 0.196 )    | <b>7.48</b> ( 4.04 , 0.081 )    | <b>3.57</b> ( 1.48 , 0.023 )    | <b>2.83</b> ( 1.12 , 0.017 )    |
| <i>Total Number of Topics in Curriculum</i>         | <b>-2.42</b> ( 1.13 , 0.047 )   | <b>-2.58</b> ( 1.05 , 0.025 )   | <b>-1.64</b> ( 0.57 , 0.008 )   | <b>-1.39</b> ( 0.45 , 0.004 )   |
| <i>Model Fit</i>                                    |                                 |                                 |                                 |                                 |
| <i>R-Square</i>                                     | <b>0.2191</b>                   | <b>0.2574</b>                   | <b>0.2205</b>                   | <b>0.2490</b>                   |
| <i>Residual Mean Sq.</i>                            | <b>1652.9</b>                   | <b>1489.0</b>                   | <b>1476.0</b>                   | <b>1331.4</b>                   |
| <i>p&lt;</i>  | <b>0.1222</b>                   | <b>0.0687</b>                   | <b>0.0270</b>                   | <b>0.0136</b>                   |
| <i>No. of Countries</i>                             | 20                              | 21                              | 32                              | 33                              |
| <i>Standardized Coefficient</i>                     |                                 |                                 |                                 |                                 |
| <i>Number of Topics Aligned with Ideal Scenario</i> | <b>0.4374</b>                   | <b>0.7331</b>                   | <b>0.8481</b>                   | <b>0.8240</b>                   |
| <i>Total Number of Topics in Curriculum</i>         | <b>-0.6969</b>                  | <b>-0.9703</b>                  | <b>-1.0044</b>                  | <b>-1.0204</b>                  |



# Puntaje grado 8 en matemáticas vs. Tasa de número de tópicos alineados / total de tópicos en el currículo

