TIMSS 2019
Transitioning to eTIMSS

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eTIMSS 2019

TIMSS 2019

IEA

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Since Last General Assembly...

- Completed converting trend items to eTIMSS format

- Completed prepilot versions of digitally enhanced items (PSIs)

- Developed plan for transitioning to eTIMSS and maintaining trends

- Worked with countries to promote eTIMSS participation

- Scheduled many TIMSS 2019 activities (eTIMSS and paperTIMSS)

Infrastructure Already Transitioned to eTIMSS

- Development of both eTIMSS and paperTIMSS managed by the *eTIMSS Assessment Builder*

  – Trend items already imported

  – Use system at 2nd NRC meeting in April to develop new items

- All translation and verification activities will use the *eTIMSS Translation System*

- eTIMSS system will print all paper booklets and questionnaires

Maintaining Trends in 2019

TIMSS has twin goals:

- Maintaining continuity to measure trends

    – PaperTIMSS links to the past

- Innovations to be relevant and take advantage of new technologies

    – eTIMSS links to the future

- PaperTIMSS and eTIMSS achievement scales need to be linked to maintain trends

Transition to eTIMSS Completed in 2023

In order to keep TIMSS up to date

- TIMSS 2019 eTIMSS and paperTIMSS start to diverge

  – 8 item blocks in common, 6 blocks not identical

- By TIMSS 2023, too far apart

  – Just 3 blocks in common, 11 blocks not identical

Enroll now in eTIMSS, if you can!

Benefits of Moving to eTIMSS

Enhanced assessment—provides extended coverage of framework, especially PSIs

- Model complex problems

- Animations

- Simulations

Interactive tasks-more engaging and motivating

- Discover and test relationships

- Manipulate data

- Can reduce reading load

Benefits of Moving to eTIMSS

Provision of tools

– Number pad for numeric entry

– Calculator

– Drawing tool

– Ruler

Capture student processes

– Gain deeper insights into student thinking

– Problem solving strategies

– Inquiry methods

Benefits of Moving to eTIMSS

Take advantage of efficiencies provided by IEA eAssessment systems

- Developing, translating/verifying, printing, delivery, data entry, and scoring

- Secure and accurate data storage

Keep pace with students' experiences in and out of school

- Students report considerable schoolwork depends on computer

- Social media

Benefits of Moving to eTIMSS

Promise for the future

- – Improved accessibility for students with disabilities

- – Better match between assessment items and student ability – given wide range of student achievement in TIMSS

- – Initial items to target students' level of achievement to deliver more efficient assessment

- – Students have better testing experience

- – TIMSS has more precise measurement

- – Eventually, reduced testing time

Major Developments to Help Countries' Transition

- Wider range of platforms

    - Extended to include PC/Windows

    - Greater variety of Android tablets

- Reduced burden to convert to eTIMSS

- Video to promote participation in eTIMSS

    - Accessible from secure website

eTIMSS Promotional Video Confidential

Converting to eTIMSS 2019

eTIMSS each grade, each subject

- 8 trend item blocks from 2015

    – Mostly "nearly identical" between eTIMSS and paperTIMSS

- 6 new blocks of digitally enhanced items, including PSIs

    – Being developed

Adapting PaperTIMSS Items to eTIMSS Format

- 450 trend items

- Essentially identical ≈80%

  - Looks the same on tablet as on paper

- Readily adaptable ≈20%

  - Slight modifications to fit smaller space (rearranging, reducing size of graphics, or use scrolling)

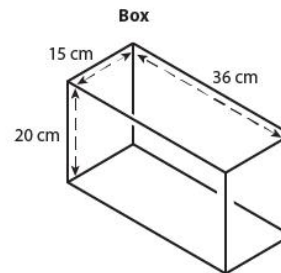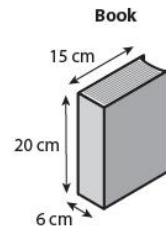- Two page items – only 5 items at 8th grade

Solid ground!

Essentially Identical

Ryan is packing books into a rectangular box.

All the books are the same size.

Book

15 cm

20 cm

6 cm

Box

15 cm

36 cm

20 cm
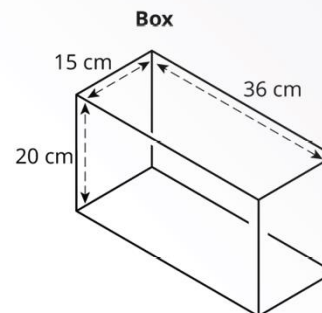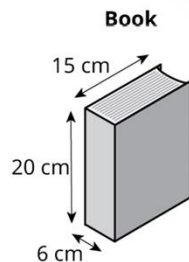
How many books will fill the box?

Answer: _____

2 Ryan is packing books into a rectangular box.

All the books are the same size.

Book

15 cm

20 cm

6 cm

Box

15 cm

36 cm

20 cm

How many books will fill the box?

Answer: _____

Readily Adaptable

One evening Peter went outside and made a drawing of a house, a tree, and the Moon. About 2 weeks later, Peter's brother, John, went outside and made a drawing of the same house, the same tree, and the Moon.

When they compared their drawings, they saw that they drew the Moon differently.

Peter's Drawing   **John's Drawing**

Whose drawing of the moon is correct?

(Check one box.)

☐   Only Peter's drawing of the moon can be correct.

☐   Only John's drawing of the moon can be correct.

☐   Both drawings of the moon can be correct.

Explain your answer.

4 One evening Peter went outside and made a drawing of a house, a tree, and the Moon. About 2 weeks later, Peter's brother, John, went outside and made a drawing of the same house, the same tree, and the Moon.

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Whose drawing of the moon is correct?

(Check one box.)

☐ Only Peter's drawing.

☐ Only John's drawing.

☐ Both drawings.

Explain your answer.

BACK   NEXT

Path to eTIMSS 2019

- Sept/Oct 2016 – prePilot – small tryout

- April 2017 – eTIMSS Pilot

  – Item equivalence study for mode effect

  – Counterbalanced design – same students

- April 2018 – Field Test

  – Newly developed eTIMSS items

- Oct 2018 – June 2019 – Data Collection

  – eTIMSS + bridge to paperTIMSS

Prepilot eTIMSS in Sept/Oct 2016

- First effort to pilot eTIMSS tablet and PC approach at 4th and 8th grades

  - 2 blocks converted restricted use items from 2015 (1 mathematics, 1 science)

  - 4 blocks PSIs (2 mathematics, 2 science)

- Each student – "the TIMSS experience"

  - 4 block combination (booklet equivalent) converted 2015 items and PSIs

- 3 countries (English speaking), ≈3 classes per grade

  - Australia (tablet), Canada (PCs), Singapore (both)

eTIMSS Pilot in April 2017

Uses **trend blocks** from 4th and 8th grade TIMSS 2015 to:

- Conduct an item equivalence study

  – Examine effect of **mode of administration** between eTIMSS and paperTIMSS

- Tryout the eTIMSS systems

  – Importing translations from 2015 and using the eTIMSS player, data monitor, and online scoring

eTIMSS Pilot in April 2017 (cont.)

Counterbalanced design

- Each student takes trend blocks in both eTIMSS and paperTIMSS format

    – Trend items only - not confounded with new material

- Each student gets the full TIMSS experience under each administration mode

    – 4 blocks each (2 math and 2 science)

- Half students take eTIMSS first, half take paperTIMSS first

    – All students take both modes, but different items

eTIMSS Pilot in April 2017 (cont.)

Sample

- At each grade, purposive sample of 800 students

  – Range of ability and backgrounds.
  – e.g., 2 classes from about 20-25 schools

- English-speaking countries only
  – 4 PSI blocks per grade in 5 classes ≈100 students

eTIMSS Pilot in April 2017 (cont.)

Item equivalence analysis

1. Item-by-item analysis to identify items that may be considered "strongly equivalent"

   – i.e., have identical item parameters under both administration modes

2. Score-level analysis to examine the effect of administration mode on student achievement scores

   – Overall and country by country mode effect

eTIMSS Pilot in April 2017 (cont.)

All eTIMSS countries should participate

- Provide better data for item equivalence study

    – More reliable and generalizable results

- Provide countries with analysis of mode effect

    – Performance on eTIMSS vs. paperTIMSS

- Gain experience in using eTIMSS systems

    – Opportunity to recommend improvements

- About 25 countries planning to participate, more welcome!

Country Milestones for Pilot

- Current activities

  – Planning participation and recruiting schools

  – Arranging for devices

  – Locating 2015 trend item blocks

- Jan-March 2017

  – Copy translations into Online Translation System

  – Prepare paperTIMSS booklets

- Mid-March to April 2017

  – Conduct data collection

Field Test in April 2018

- Similar in scope to past TIMSS field tests
  - Need 6 new blocks per subject, field test twice needed

- eTIMSS countries
  - field test the newly developed eTIMSS items

- paperTIMSS countries
  - field test newly developed paperTIMSS items

- Maintain comparability between eTIMSS and paperTIMSS items as much as possible

TIMSS 2019 Data Collection
Oct 2018 – June 2019

paperTIMSS

- Same amount of item blocks as usual - trend items and newly developed items

  - 14 booklets per grade

- Usual TIMSS sample – at least 150 schools, at least one class per school

TIMSS 2019 Data Collection
Oct 2018 – June 2019

eTIMSS

- Same amount of item blocks as usual - trend items and new digitally enhanced items, including PSIs – 14 booklet equivalents

- Usual TIMSS sample – at least 150 schools, at least one class per school

TIMSS 2019 Data Collection
Oct 2018 – June 2019

eTIMSS

- Same amount of item blocks as usual - trend items and new digitally enhanced items, including PSIs – 14 booklet equivalents

- Usual TIMSS sample – at least 150 schools, at least one class per school

Also need bridge to 2015 PaperTIMSS (reduced)

- 8 paper booklets 2015 trend items (as in pilot)

- Expand sample 25% – approx. 1,500 students, an additional class from a subsample of schools

eTIMSS and paperTIMSS 2019 Trend Scaling

- Repeat eTIMSS item-by-item analysis to confirm those trend items considered "strongly equivalent"

  – i.e., have identical item parameters under both administration modes, and can be treated as the same item for measuring trends

  – Non-equivalent items will be treated as new

- TIMSS 2019 scaling – all data together

  – Maintain eTIMSS trends by including both eTIMSS sample and bridge sample

  – Maintain paperTIMSS trends usual way

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