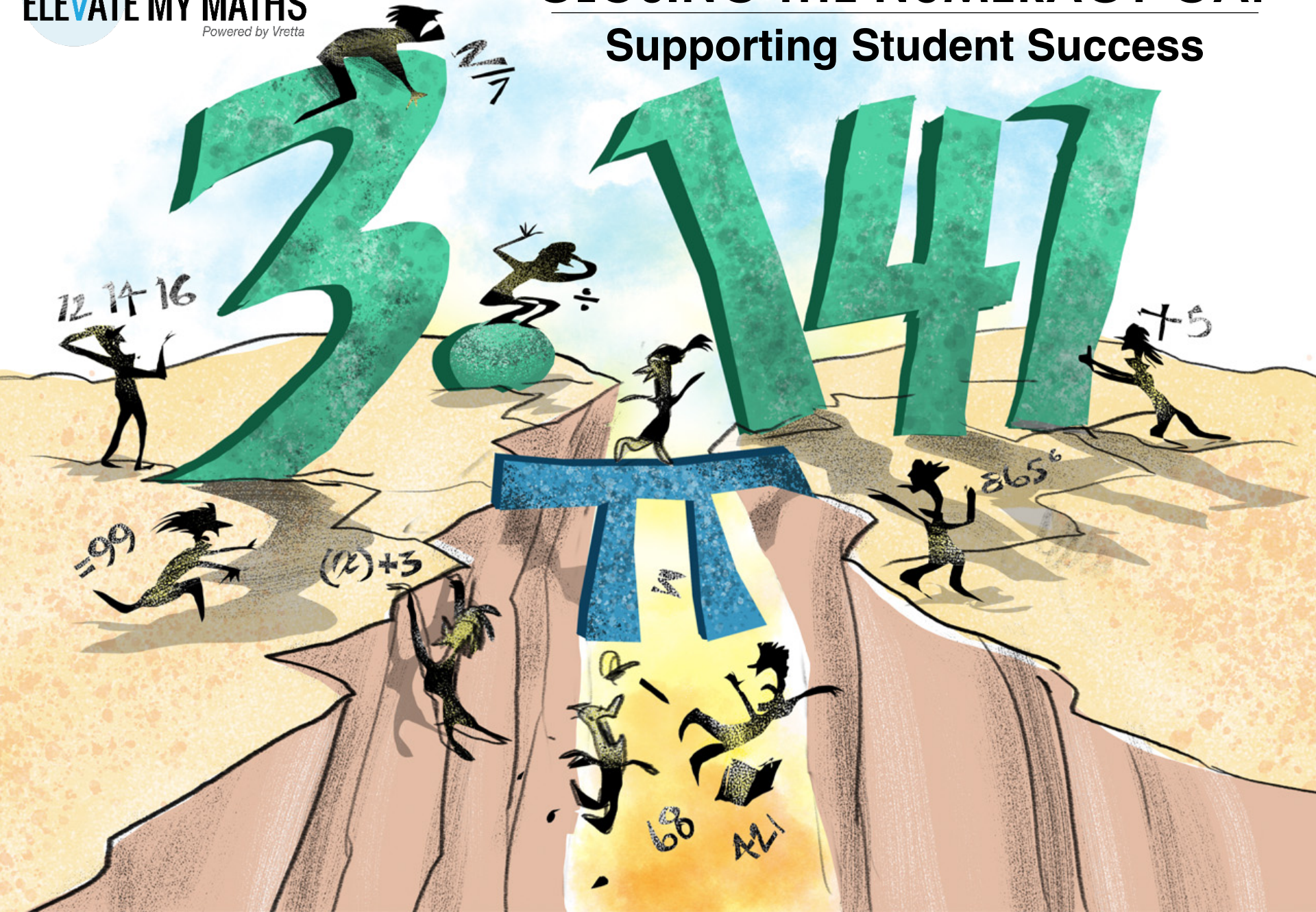


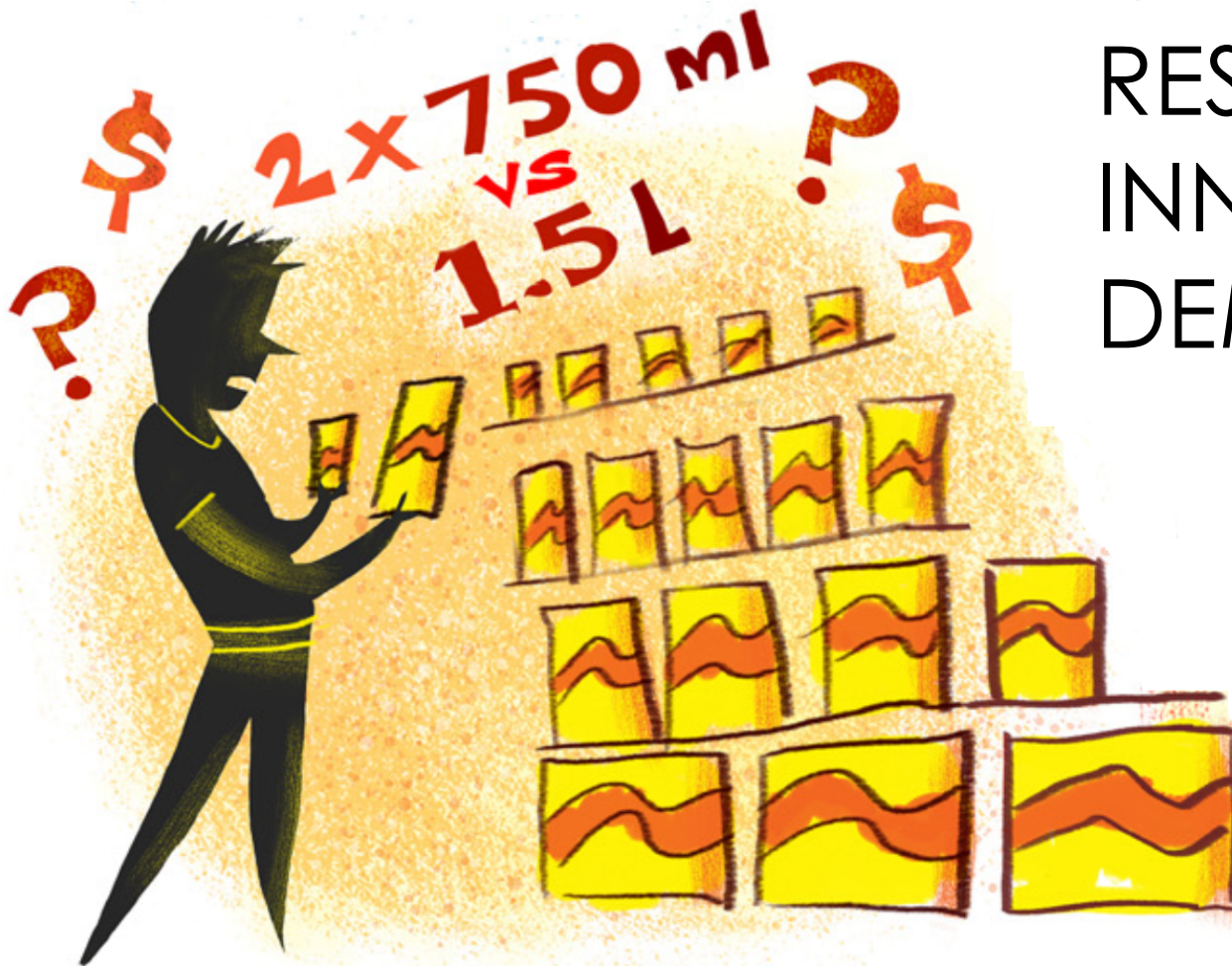
CLOSING THE NUMERACY GAP

Supporting Student Success



AGENDA

CHALLENGE
RESPONSE
INNOVATION
DEMO



CHALLENGE



NUMERACY

Ability to use mathematical knowledge and skills in real world situations.

NUMERACY GAP

Difference between the levels of numeracy required for full participation in a technological society and the present levels of numeracy.



NUMERACY GAP: CANADA

54.7%

OF CANADIAN ADULTS
ARE BELOW THE
DESIRED LEVEL OF
NUMERACY*

47%
In 2003

GLOBAL RANKING IN MATHEMATICS FOR CANADA** 15 YEAR-OLDS

2006

TAIWAN
FINLAND
KOREA
HONG KONG
NETHERLANDS
SWITZERLAND



MACAU
LIECHTENSTEIN
JAPAN
NEW ZEALAND
BELGIUM
AUSTRALIA
ESTONIA
DENMARK

2009

SHANGHAI
SINGAPORE
HONG KONG
SOUTH KOREA
TAIWAN
FINLAND
LIECHTENSTEIN
SWITZERLAND
JAPAN



NETHERLANDS
MACAU
NEW ZEALAND
BELGIUM
AUSTRALIA

2012

SHANGHAI
SINGAPORE
HONG KONG
TAIWAN
SOUTH KOREA
MACAU
JAPAN
LIECHTENSTEIN
SWITZERLAND
NETHERLANDS
ESTONIA
FINLAND



POLAND
BELGIUM

2015

SINGAPORE
HONG KONG
MACAU
TAIWAN
JAPAN
B-S-J-G (China)
SOUTH KOREA
SWITZERLAND
ESTONIA



NETHERLANDS
DENMARK
FINLAND
SLOVENIA
BELGIUM

Results from the Organization for Economic Co-operation and Development (OECD)
(*) Programme for the International Assessment of Adult Competencies (PIAAC)
(**) Programme for International Student Assessment (PISA)

NUMERACY GAP: IMPACT



EMPLOYMENT SKILL GAP

Growing gap between the numeracy ability of employees and the numeracy expectations of employers.

PAY GAP

+1 increase in numeracy scores = **19.3% wage increase**

3x more STEM related job openings in the past decade

People in STEM fields tend to **earn 26% more**

NUMERACY GAP: IMPACT

SOCIAL EQUITY

Many countries are guilty of both high wage and high skill inequality.

Education is often failing to deliver on equality, one of its most cherished values.

GENDER/MINORITY GAP

Systematic disadvantage to girls and women

- Entrenched attitudes
- Lack of role models

NUMERACY GAP: CAUSES

SOCIETAL ATTITUDES

The myth of the math gene

Some people can do math while others cannot.



-
- ✓ Everyone can be numerate!
 - ✓ Everyone needs to be numerate.
 - ✓ Improved numeracy is a matter of social justice.

NUMERACY GAP: CAUSES

PROBLEMS WITH MATHEMATICS CLASSROOMS

Mindless following of procedures.

Artificial problems with no real-world context.

Over-reliance on calculators.

NUMERACY GAP: CAUSES

LACK OF OPPORTUNITY FOR CATCHING UP LATER

- Secondary school teachers do not have time to remediate students on elementary level concepts.
- Some students who graduate secondary school are reported to have difficulties with elementary math skills in College courses as a result.

RESPONSE





2004

College Math Project College Student Achievement Project

10
YEARS

RESEARCH
INITIATED IN
2004

ALL 24 ON COLLEGES (22 EN & 2 FR), 72 ON SCHOOL
BOARDS,
FUNDED BY THE MINISTRY OF EDUCATION &
THE MINISTRY OF TRAINING, COLLEGES AND UNIVERSITIES



Ontario

MINISTRY OF EDUCATION
MINISTÈRE DE L'ÉDUCATION



Ontario

MINISTRY OF TRAINING, COLLEGES, AND UNIVERSITIES
MINISTÈRE DE LA FORMATION ET DES COLLEGES ET UNIVERSITES



GEORGIAN
COLLEGE



ST. CLAIR
COLLEGE

LA CITÉ
LE COLLEGE D'ARTS APPLIQUES
ET DE TECHNOLOGIE

ALGONQUIN
COLLEGE

Collège Boréal



HUMBER

canadore
college

Lambton
College



CAMBRIAN
COLLEGE



Niagara
College
Canada



St. Lawrence
College



Northern
COLLEGE



FANSHAWE
COLLEGE

CONESTOGA



Confederation

Fleming College

MOHAWK

Seneca Sheridan



DURHAM
COLLEGE
SUCCESS MATTERS

COLLEGE
TRAINING

INCREASING STUDENT SUCCESS & RETENTION

PROGRAM CLUSTERS AND SUB-CLUSTERS



Applied Arts Arts



Business Accounting & Finance Business Administration Office Administration



Foundations Pre-Arts Pre-Business Pre-Health Pre-Human Services Pre-Technology



General General Arts & Science (1 year) General Arts & Science (2 years)



Human Services Health Services Hospitality & Tourism Human Services

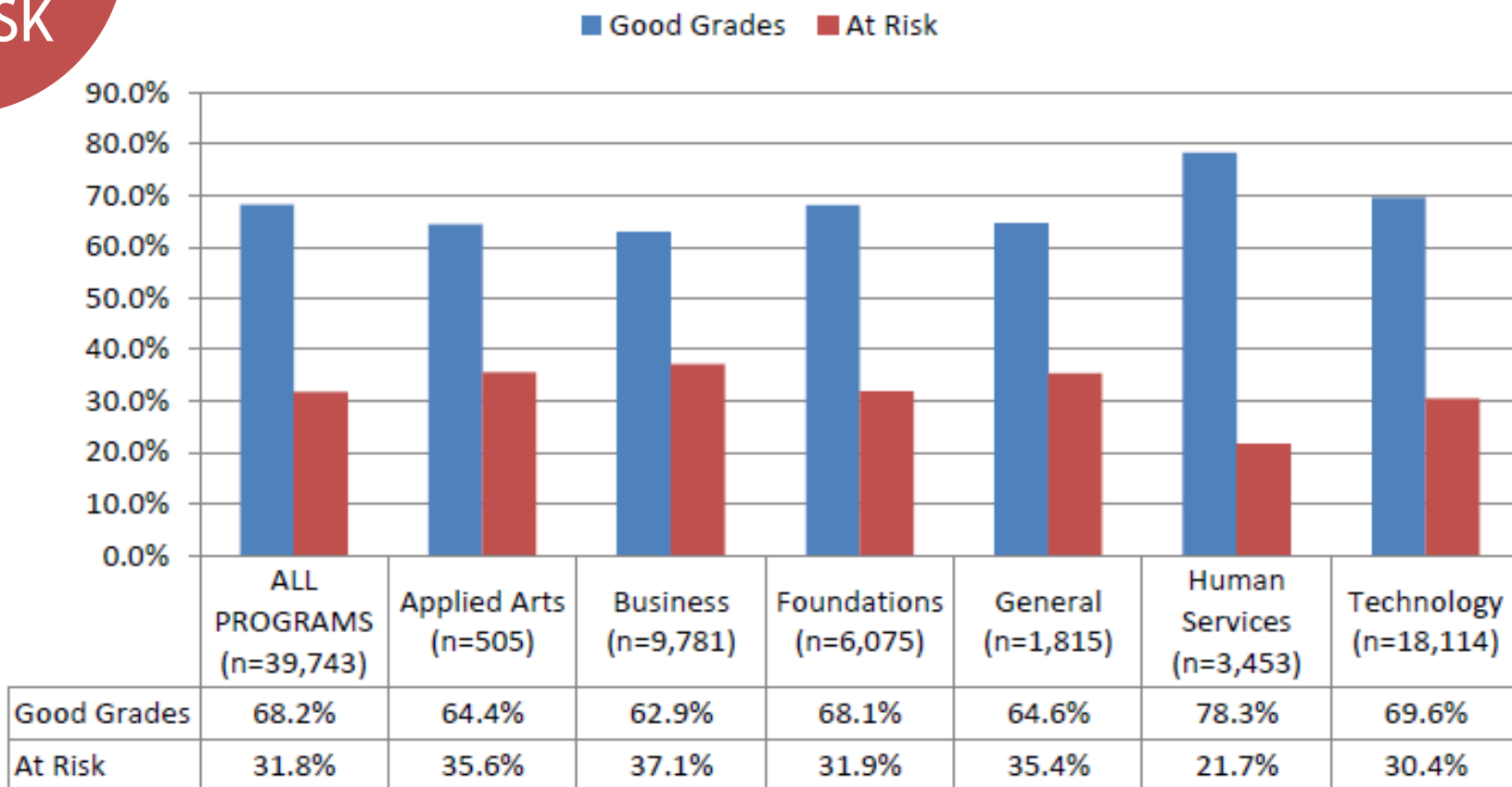


Technology Applied Science Computer Construction Electrical Mechanical

STUDENTS “AT RISK”

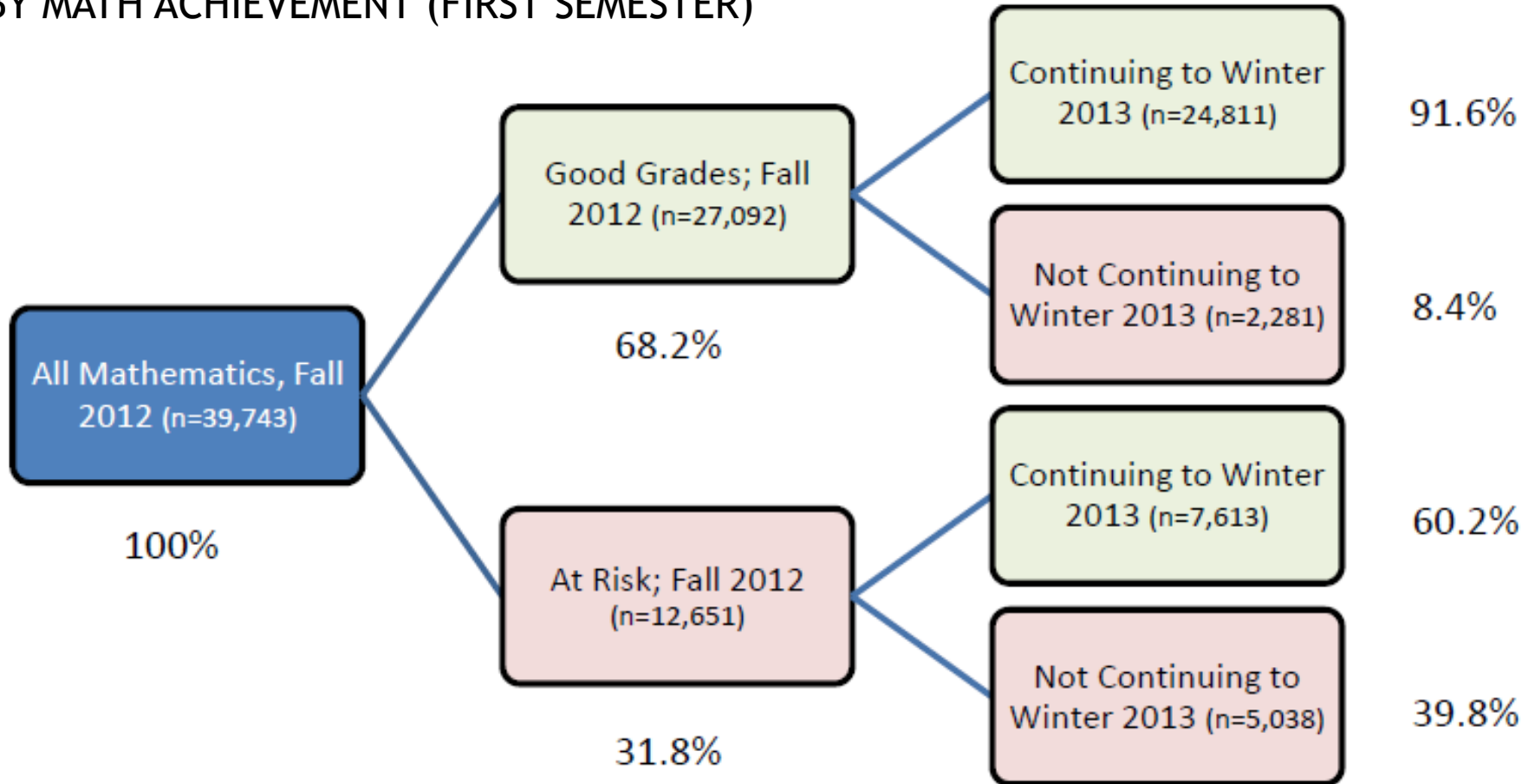
~1/
3
AT RISK

students are “at risk” of **not completing their** program due to their grades in first semester mathematics courses



STUDENTS “DROPPING OUT”

PROGRAM ENROLMENT (SECOND SEMESTER)
BY MATH ACHIEVEMENT (FIRST SEMESTER)



TOPICS AND SUB-TOPICS

Whole Numbers

*Place value, reading and writing numbers
Equality/inequality
Rounding
Absolute value*

Arithmetic

*Addition
Subtraction
Multiplication
Division
Exponential notation*

*Order of operations
Prime numbers
Factors and multiples
Scientific notation*

Integers

*Adding and subtracting negatives
Multiplying and dividing negatives
Exponents with negatives*

Decimals

*Place value, reading and writing numbers
Arithmetic operations with decimals
Rounding*

Fractions

*Types of fractions, equivalent fractions,
conversion
Addition and subtraction
Multiplication
Division
Order of operations*

Ratios and Proportions

*Creating ratios
Ratios in simplest form
Calculations involving ratios
Rates
Proportions*

Percents

*Converting between percent, fraction and decimal
Calculate amount given base and percent
Calculate percent given amount and base
Calculate base given percent and amount
Calculate percent change*







Basic Algebra

*Variable expressions
Monomial operations
Binomial operations
Polynomial operations
Factoring
Solving equations*

Measurements

*Mass and length
Metric-imperial conversions
Area and volume (capacity)*

ASSESSMENT FOR LEARNING

	DIAGNOSTIC ASSESSMENT	UPGRADING MODULES	SUMMATIVE ASSESSMENT
POST-ADMISSION (OPTION 1)			
POST-ADMISSION (OPTION 2)			
LEARNING			

INNOVATION



1 DIAGNOSTIC ASSESSMENT

IDENTIFY SKILLS THAT REQUIRE MASTERY

DIAGNOSE

Monique Bery
Settings | Logout

60% Diagnose

Upgrade

Assess

Download Certificate

Contact Us

Multiply as a fraction

$$\frac{6}{7} \times \frac{5}{12}$$

2 UPGRADING MODULES

ACHIEVE MASTERY

UPGRADE

Monique Bery
Settings | Logout

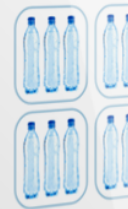
60% Diagnose

Upgrade

- Properties of Numbers
- Basic Operations
- Fractions
- Advanced Operations
- Percents and Percent Change
- Units of Measurement

Assess

Contact Us



$$\frac{12 \text{ bottles}}{4 \text{ people}} = 3 \text{ bottles}$$

3 SUMMATIVE ASSESSMENT

ASSESS LEVEL OF MASTERY

ASSESS

Monique Bery
Settings | Logout

60% Diagnose

Upgrade

90% Assess

Download Certificate

Contact Us

Perform the arithmetic

$$2 + 4 \div 2 =$$

1 DIAGNOSTIC ASSESSMENT

IDENTIFY SKILLS THAT
REQUIRE MASTERY

DIAGNOSE

Monique Bery
Settings | Logout

60% Diagnose

Upgrade

Assess

Download Certificate

Contact Us

Multiply and express
as a fraction in its lowest terms

$$\frac{6}{7} \times \frac{5}{12} \times \frac{21}{25} = \frac{\square}{\square}$$

- Assessment Framework
 - ✓ Content topics
 - ✓ Performance expectation: (A) Knowing, (B) Applying, and (C) Reasoning
- Assessment Items
 - ✓ Constructed (written) and selected (multiple-choice) response types
 - ✓ English and French languages
 - ✓ Field tested and psychometrically validated
- Test Design
 - ✓ Unique for every test taker
 - ✓ Equally representative
 - ✓ Long enough (i.e., sufficient number of test items) but short enough to complete in a reasonable length of time

2 UPGRADING MODULES

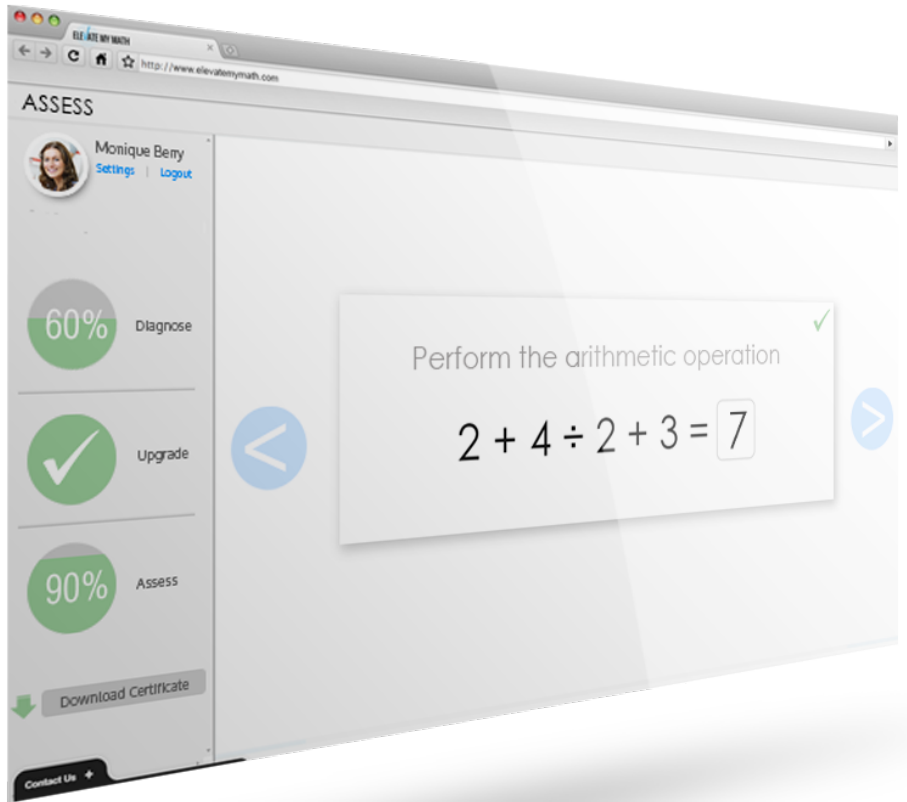
ACHIEVE
MASTERY

The screenshot shows the 'UPGRADE' module interface. At the top, it says 'UPGRADE' and 'Monique Berry' with 'Settings' and 'Logout' links. Below that, there's a progress indicator for 'Diagnose' at 60%. A 'ROADTRIP' scenario is shown with '4 friends on a ROADTRIP'. A math problem is displayed: $\frac{12 \text{ bottles}}{4 \text{ people}} = 3 \text{ bottles per person}$. The interface also lists various math topics: Properties of Numbers, Basic Operations, Fractions, Advanced Operations, Percents and Percent Change, and Units of Measurement. There's also an 'Assess' button and a 'Contact Us' link.

- Mastery-based Learning
 - ✓ Topics are broken down to micro-steps
 - ✓ Various types of interactive practice scenarios
- Individualized Learning
 - ✓ Self paced.
- Differentiated Learning
 - ✓ Ability to use the modules in class, or assign them as homework

3 SUMMATIVE ASSESSMENT

ASSESS LEVEL OF MASTERY



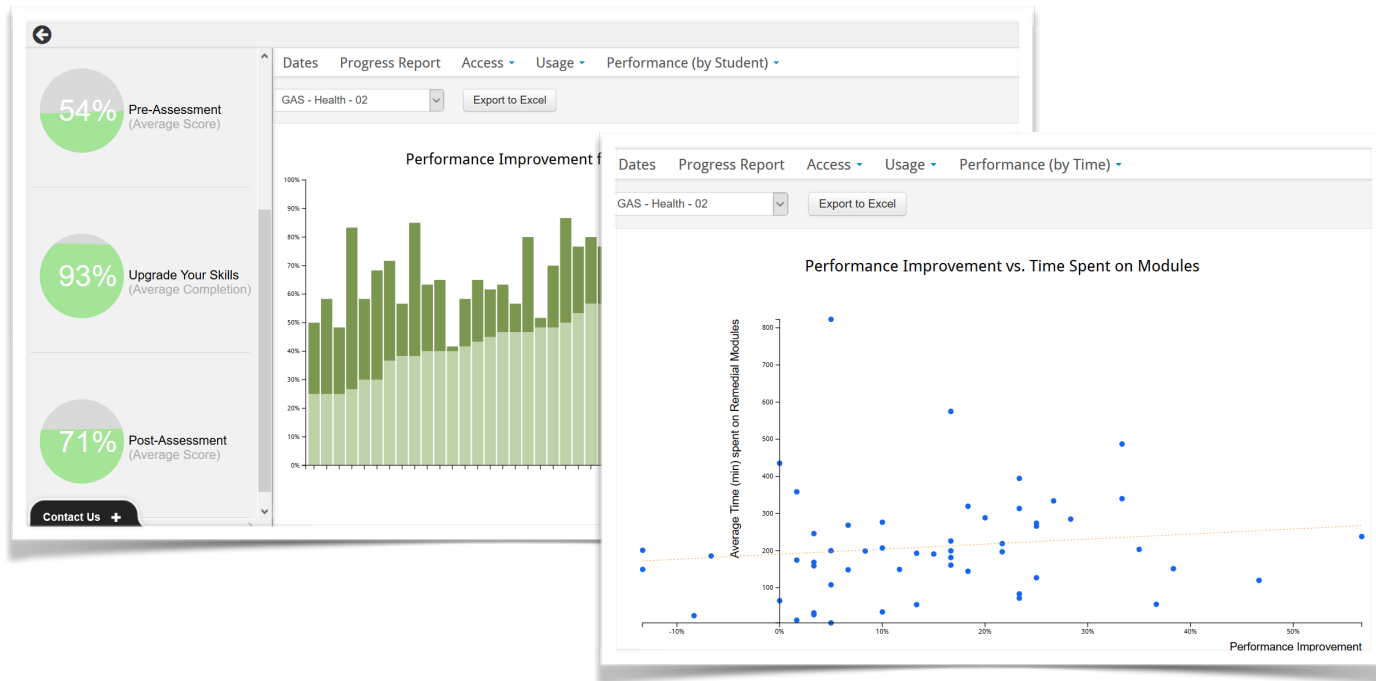
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 - ✓ Equally representative
 - ✓ Long enough (i.e., sufficient number of test items) but short enough to complete in a reasonable length of time

MONITORING

PROGRESS & PERFORMANCE

REAL-TIME DASHBOARDS

- To identify students “at risk” of not completing the course and provide them with the required guidance to succeed.
- For students to monitor their own progress.



1 DIAGNOSTIC ASSESSMENT

IDENTIFY SKILLS THAT REQUIRE MASTERY

OCMT HIGH-SCHOOL EDITION 642

Jessica withdrew \$700.00 in \$20 bills to spend on gifts for her family. She buys gifts that cost \$25.08, \$42.65, \$25.48, \$33.56, and \$39.65. How many \$20 bills does she have left?

bills

1 2 3 4 5 -

6 7 8 9 0 . Clear

Previous 2/36 Next




2 UPGRADING MODULES

ACHIEVE MASTERY

Rate Section 2

: :

\$3000 \$4000 \$1000

What is the ratio of Jim's investment to Pam's investment to Michael's investment? Enter your answer as a ratio.

1 2 3 4 5

6 7 8 9 0 . enter

Vretta

3 SUMMATIVE ASSESSMENT

ASSESS LEVEL OF MASTERY

OCMT HIGH-SCHOOL EDITION 642

Calculate.
Express the result as a mixed number in lowest terms.

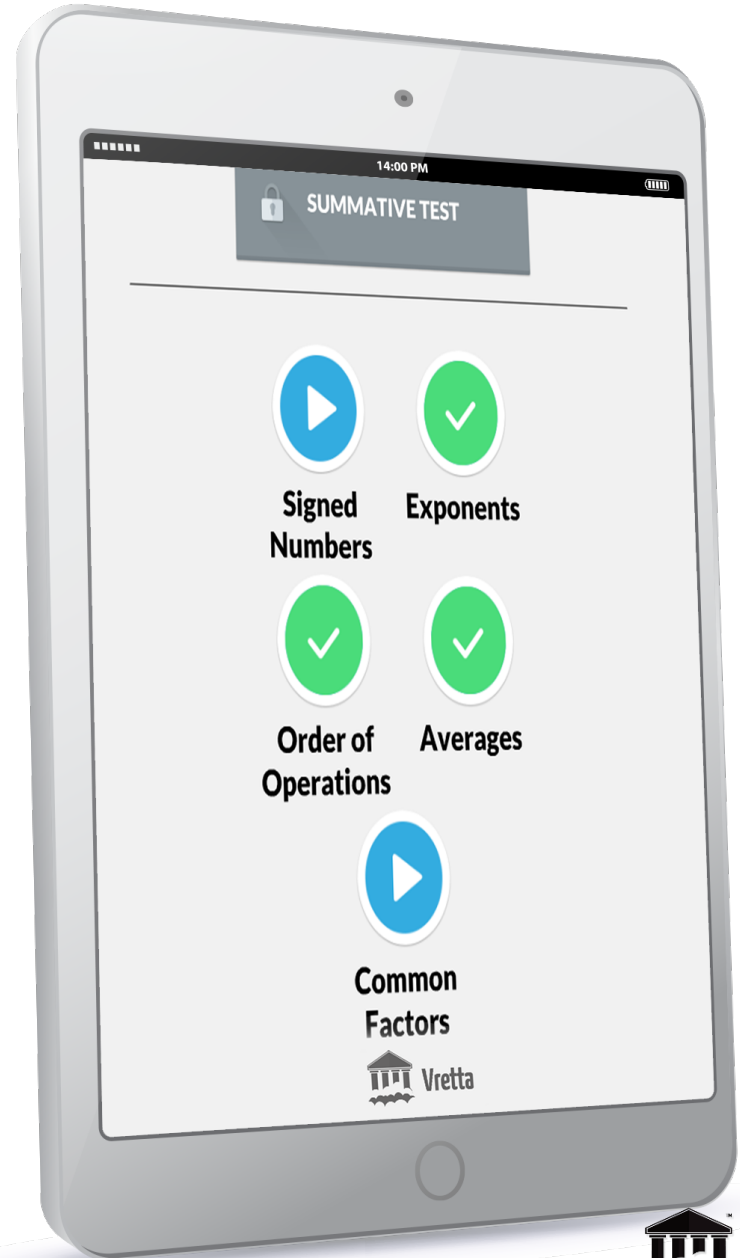
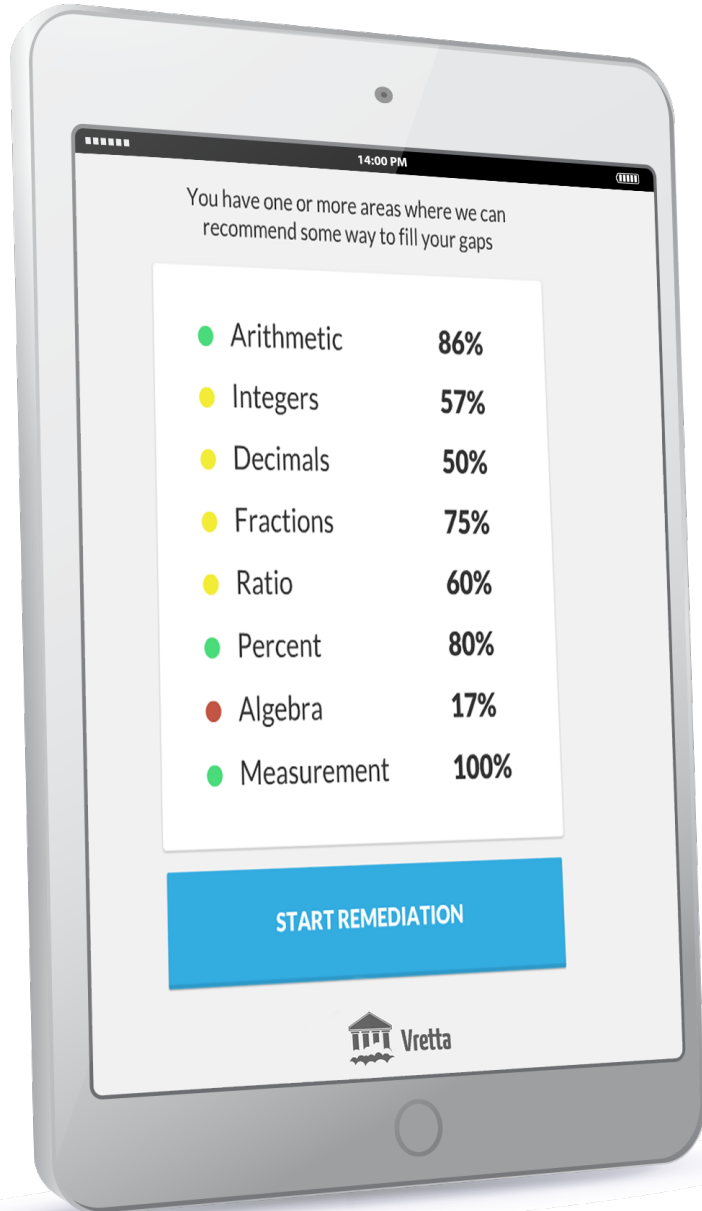
$4\frac{1}{2} \times 5\frac{1}{2} =$

1 2 3 4 5 -

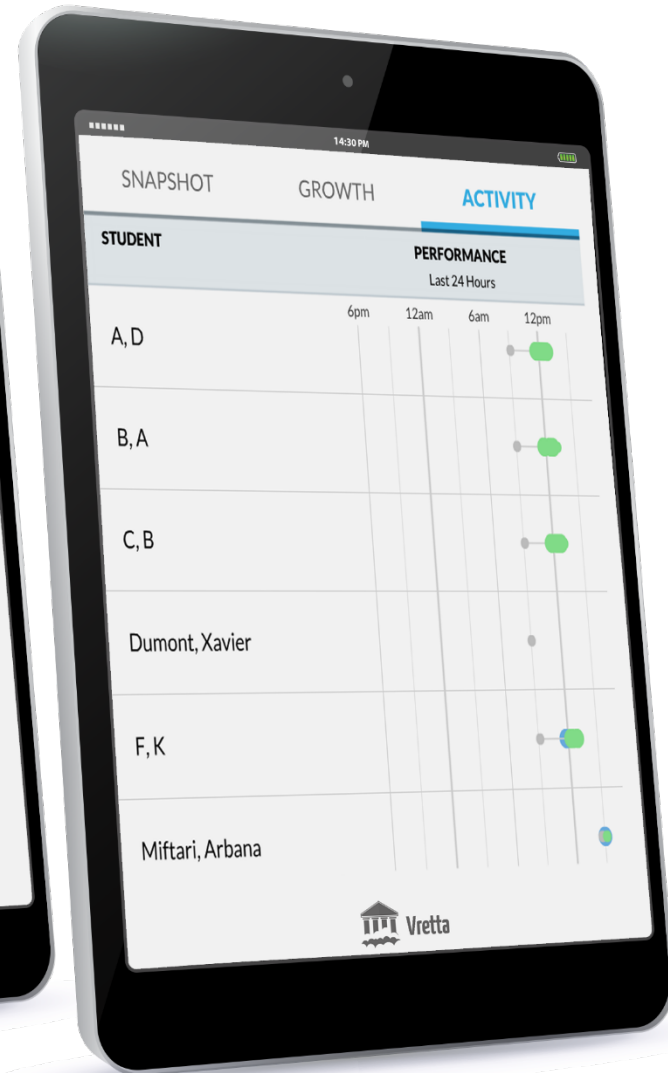
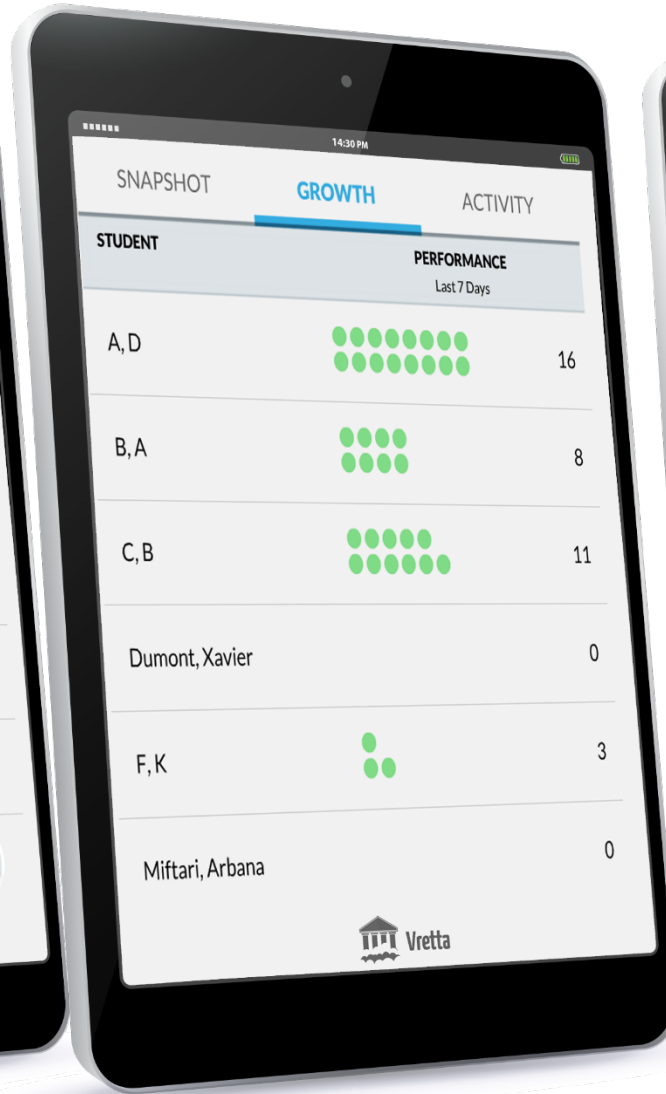
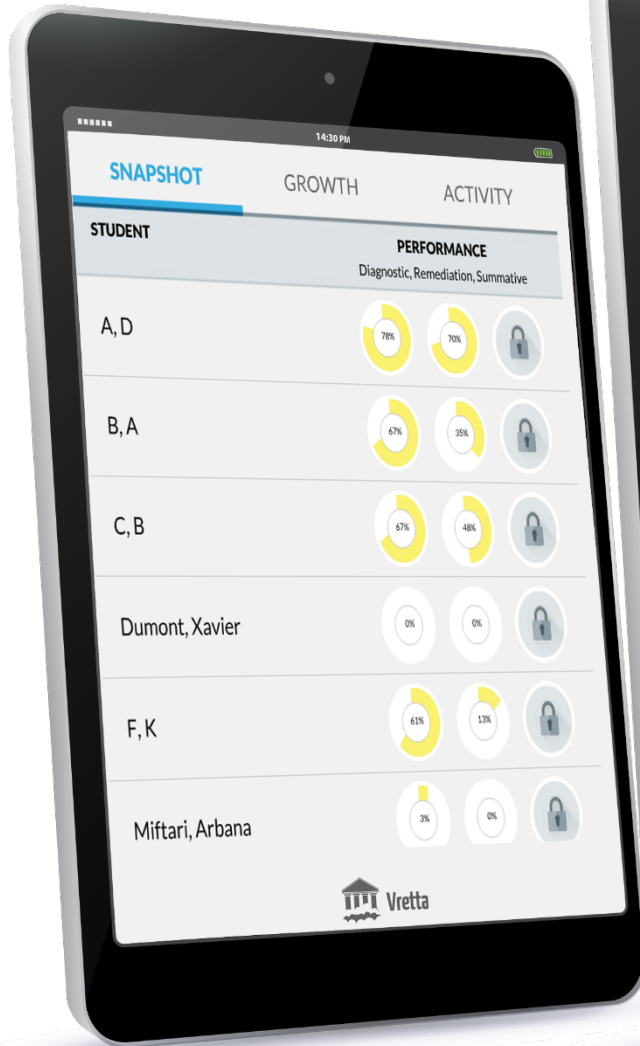
6 7 8 9 0 . Clear

Previous 2/36 Next

STUDENT DASHBOARDS



MONITORING PROGRESS & PERFORMANCE OF STUDENTS



USES

ASSIGNMENT

DURING THE FIRST MONTH OF THE MATH COURSE

Students complete Elevate My Maths on their own to acquire the pre-requisite skills for the course and improve success. This also increases their confidence and improves retention.

STREAMING

POST ADMISSION

Students complete Elevate My Maths in preparation for the placement test. The Post Test is used as the placement test (proctored environment) to stream students into appropriate courses.

LEARNING

THROUGH THE ENTIRE COURSE

Students have access to Elevate My Maths to practice throughout the semester. This is also used in Learning Centres to support students who have weak foundational math skills.



2018 WINNER

BEST TRANSFORMATIONAL PROJECT

For Raising the Level of Numeracy & Supporting Student Success



DEMO



ESSENTIAL NUMERACY SKILLS

POWERED BY VRETTA

IDENTIFY SKILLS THAT REQUIRE MASTERY



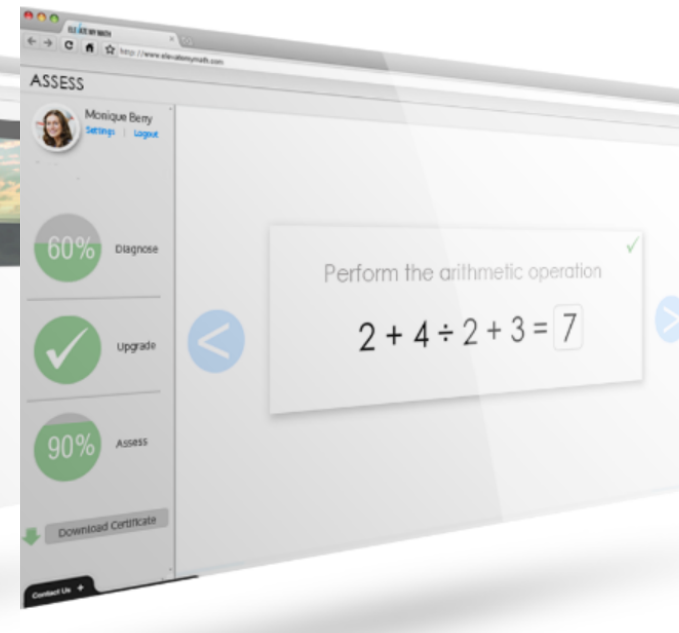
Candidates complete a carefully designed diagnostic assessment that identifies the key numeracy skills that need to be mastered.

ACHIEVE MASTERY



Candidates master the required skills by working through highlighted interactive tools that are designed to provide them with feedback and support throughout the mastery experience.

ASSESS LEVEL OF MASTERY



Candidates assess their level of mastery through a final assessment.

DOWNLOAD CERTIFICATE

On completion of the assessment, candidates can download a customized certificate of *Achievement in Numeracy* that can be submitted to their potential employers.

Personalized Learning

For Primary and Secondary School Students



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Éducation nationale,
de l'Enfance et de la Jeunesse

Service de coordination de la recherche
et de l'innovation pédagogiques
et technologiques



MINISTÈRE
DE L'ÉDUCATION
NATIONALE, DE
L'ENSEIGNEMENT
SUPÉRIEUR ET DE
LA RECHERCHE



GOVERNO DE
PORTUGAL

MINISTÉRIO DA EDUCAÇÃO
E CIÊNCIA

Assessment for Learning



LUXEMBOURG
INSTITUTE
OF SCIENCE
AND TECHNOLOGY



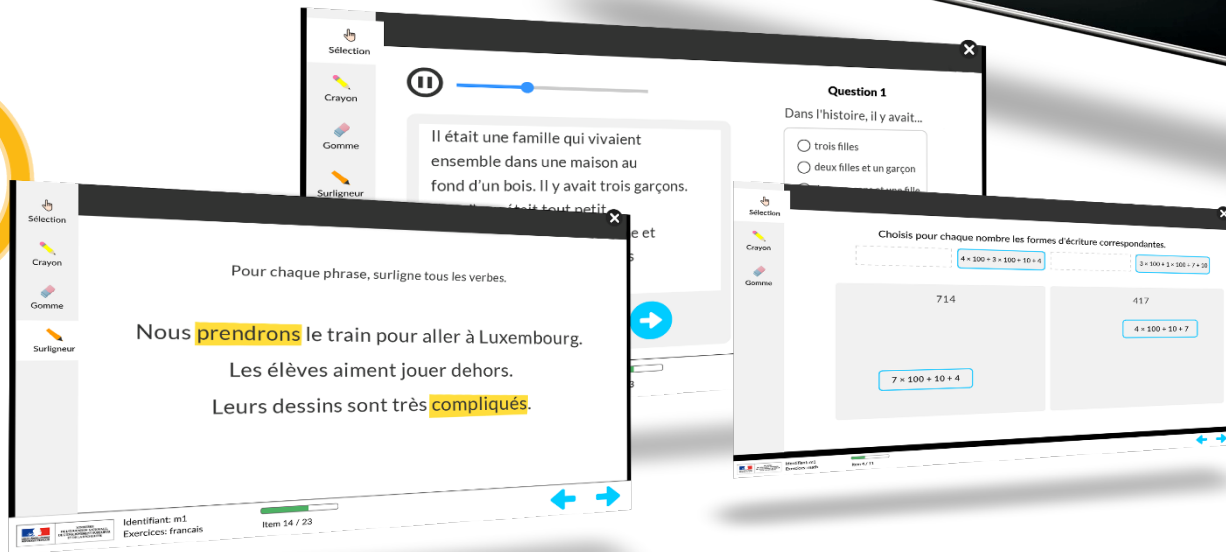
LUCET

LUXEMBOURG CENTRE
FOR EDUCATIONAL TESTING

Large Scale Assessments

dtab

For Primary and Secondary School Students





www.ElevateMyMaths.com



OUR VISION
is a world where everyone
ENJOYS MATH

