GOVERNMENT OF DUBAI

DUBAI Knowledge المعرفة

TIMSS 2015 School Report

GEMS World Academy

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS

2015

2019

Knowledge and Human Development Authority

P. O. Box: 500008, Dubai, United Arab Emirates

Tel: +971 4 364 0000 Fax: +971 4 364 0001

www.khda.gov.ae

Table of Contents

What is TIMSS?

TIMSS (Trends in International Mathemactics and Science Study) is an international assessment that has been conducted in over 50 countries every four years since 1995, under the auspices of the International Association for the Evaluation of Educational Achievement (IEA). Dubai participated, as part of the UAE, for the first time in 2007. TIMSS measures the achievement of students in Grade 4 and 8 in mathematics and science. Through this, TIMSS collects extensive, comparative background data about the standards of learning and teaching in these subjects, across primary and lower secondary school, in each of the participating countries.

In 2015, in Dubai, more than 15,000 students, from both Grades 4 and 8 participated in TIMSS. The average student score was above the international mean for the first time. Schools in Dubai are highly diverse in terms of the curriculum, with more than ten different, international curricula in operation. Considerable variation was found in student achievement across schools offering different curricula.

This report summarises the performance of students in your school, who sat for the TIMSS 2015 assessments. The overall results from TIMSS provide very useful information for school leaders. The achievement of students, in key areas of learning, is central to the annual inspection process in Dubai. Leaders can use the school level reports to study strengths and weaknesses in the achievement of their students in mathematics and science. They are also able to compare the achievement of students in their own school with international benchmarks. Additionally, leaders can compare the achievement of their own students with that of students in other schools in Dubai and more specifically, other schools in Dubai following a similar curriculum. TIMSS is administered in the language of instruction of your school.

This detailed assessment helps school leaders and teachers to better align the content of lessons and the broader curriculum to the identified needs of students in the school. Inspectors will have the school level information prior to each inspection and will evaluate the success of school leaders in using the data provided to match the curriculum and class activities to the learning needs of students in the school. The inspectors' judgements about students' attainment and progress, assessment, leadership and self-evaluation will be informed by each school's effective usage of TIMSS data.

UAE VISION 2021: First Rate Education

The UAE Vision 2021 was launched by H.H. Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai in 2014 .Its pillars have been mapped into six national priorities which represent the key focus sectors of government action in the subsequent years. One of these six priorities is related to education and is called "Firs Rate Education". Below are the indicators and targets that all education stake holders must achieve altogether.

Education Indicators & Targets

There are eight education related indicators and targets, two of which are related to international assessments.This report focuses on TIMSS

Index	INDICATOR	TARGET
1	Average TIMSS Score	Among the top 15 countries
2	Average PISA Score	Among the top 20 countries
3	Upper Secondary Graduation Rate	98%
4	Enrollment Rate in Preschools (public and private)	95%
5	% of Students with High Skills in Arabic	90%
6	% of Schools with High Quality Teachers	100%
7	% of Schools with Highly Effective School Leadership	100%
8	Enrollment Rate in Foundation Year	0%

Your TIMSS National Agenda Targets

In order to work towards achieving TIMSS targets in the UAE National Agenda, and based upon the TIMSS results for each school in 2011, KHDA set individual targets for all private schools in Dubai.
The table below shows your school's performance in 2015 TIMSS against KHDA set targets.

2015 Performance against set targets	Grade 4		Grade 8	
	Mathematics	Science	Mathematics	Science
Your TIMSS 2015 Target Scores based on 2011 results	578	574	560	556
Actual TIMSS 2015 Scores	556	570	545	541

Using TIMSS 2015 results, every school now receives a new target for moving to the next achievement level in TIMSS, in 2019. Four targets, for each of the domains in TIMSS, are described in the table below, according to the different achievement levels in TIMSS. Although, the individual targets are ambitious, the detailed information presented in this report should provide school leaders with a full understanding of their students' performances in TIMSS. Therefore, it is important that school leaders use all the data presented in the different sections of this report to strategically plan for the meeting of these targets.

Your School New 2019 targets				
	Grade 4		Grade 8	
	Mathematics	Science	Mathematics	Science
Future TIMSS 2019 Target Scores	566	580	565	561

KHDA continues to monitor each school's performance against their National Agenda targets through annual school inspections. In 2015, KHDA launched the National Agenda Parameter (N.A.P), which is a method for measuring and monitoring schools' progress towards achieving their individual National Agenda targets, through the use of external benchmark tests.

Inspectors evaluate:
- The quality of data analysis received from N.A.P and use of it to impact on education.
- The extent to which schools have modified their curriculum to address shortfalls, and how teaching methods have been adapted to engage students in aspects of their learning that are in need of improvement; (e.g. critical thinking or problem solving).
- The validity of each school's assessment methods so that progress towards targets can be accurately and reliably measured.
- The progress students are making towards targets in mathematics, reading and science - the differences in the progress of girls and boys and between Emirati and expatriate students.

GEMS World Academy

Summary

School Profile:

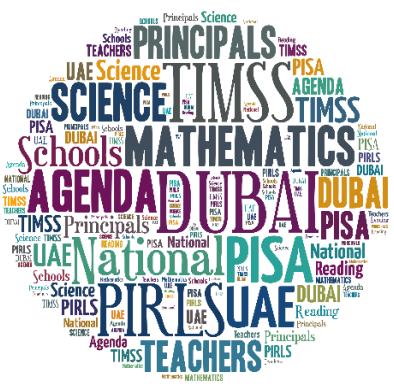
School Type	Private
School Curriculum	IB
Location	Dubai
Number of Students Assessed in Grade 4	40
Number of Students Assessed in Grade 8	44

Selecting students at your school

The students' sample selection process occurred through two phases to assure the representation of the schools sample and the accuracy of the data. Students were sampled using an advanced statistical technique to ensure representative sampling in each of the relevant curricula. The sampling was overseen by the International Association for the Evaluation of Educational Achievement (IEA) to maintain strict adherence. The basic design for the TIMSS sample is referred to as a two-stage stratified cluster sample design. The first stage consisted of establishing a sample of schools.The second stage consisted of classes (mathematics or science) selected at random from the target grade levels (4 or 8) in the sampled schools. The students in the selected classes were representative of the students in the population and weightings were used to adjust for any differences arising from intended features of the design (e.g. to over-sample minorities) or non-participation by students who were selected. In this way, measures of achievement could be provided for the population, based on the responses of a sample of students, along with the confidence interval to indicate the precision of those measures.

Overall Performance

Grade/Sub	Math	Benchmark
Grade 4	556	High International Benchmark
Grade 8	545	Intermediate International Benchmark
Grade/Sub	**Science**	**Benchmark**
Grade 4	570	High International Benchmark
Grade 8	541	Intermediate International Benchmark



Advanced International Benchmark
High International Benchmark
Intermediate International Benchmark
Low International Benchmarking
Below Low International Benchmarking

How well did your students achieve compared to their peers in Dubai?

Compared To		Grade 4		Grade 8	
		Math	Science	Math	Science
All Private Schools Participating in Dubai	Average Score	521	530	524	538
		Significantly **higher** than TIMSS center-point	Significantly **higher** than TIMSS center-point	Significantly **higher** than TIMSS center-point	Significantly **higher** than TIMSS center-point
Your School	Average Score	556	570	545	541
		Significantly Higher than TIMSS center-point	Significantly Higher than TIMSS center-point	Significantly Higher than TIMSS center-point	Significantly Higher than TIMSS center-point

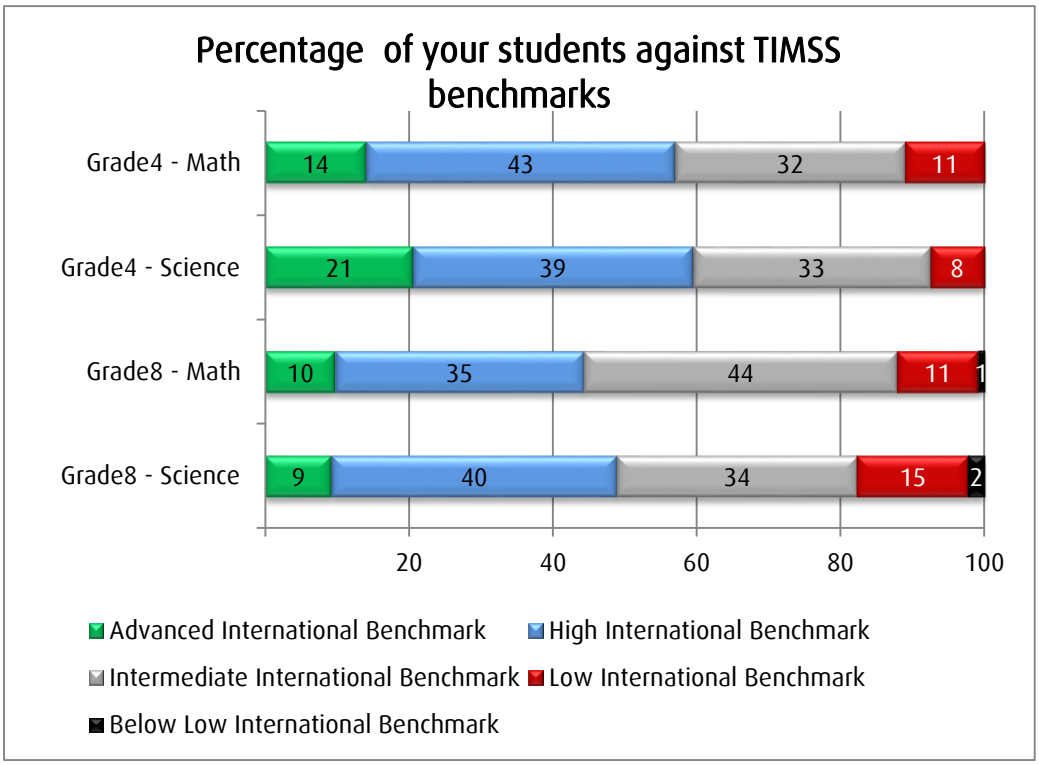
Performance of students in different curricula offered in Dubai

Curriculum	Grade 4 Math	Grade 4 Science	Grade 8 Math	Grade 4 Science
Private - UK	553	558	554	568
Private - Indian	534	555	533	556
Private - IB	528	531	547	550
Private - US	467	498	479	486
Private - MoE	449	441	478	488

**NA : Not Applicable

How well did *your* students achieve against TIMSS International Benchmarks?

This chart shows the distribution of your students across each of the International Benchmark Levels. The chart indicates the percentage of students who have reached achievement levels at every benchmark.



*The total values might not add up to 100% due to rounding

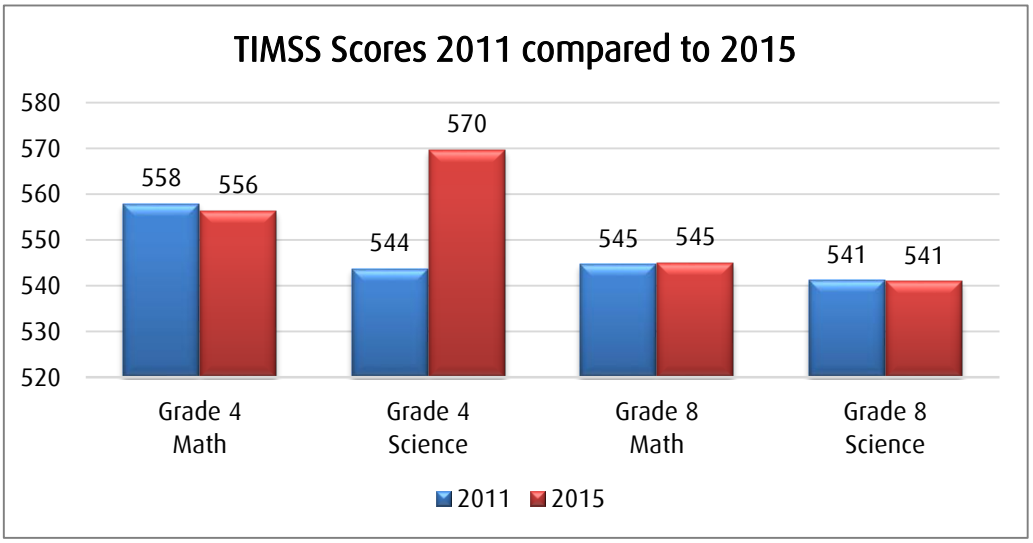
TIMSS International Benchmarks

Benchmark Level	Benchmark threshold
Advanced International Benchmark	625
High International Benchmark	550
Centre-point (average scale)	500
Intermediate International Benchmark	475
Low International Benchmark	400

* Please refer to the Appendix for full descriptions of the international benchmarks

Change Over Time

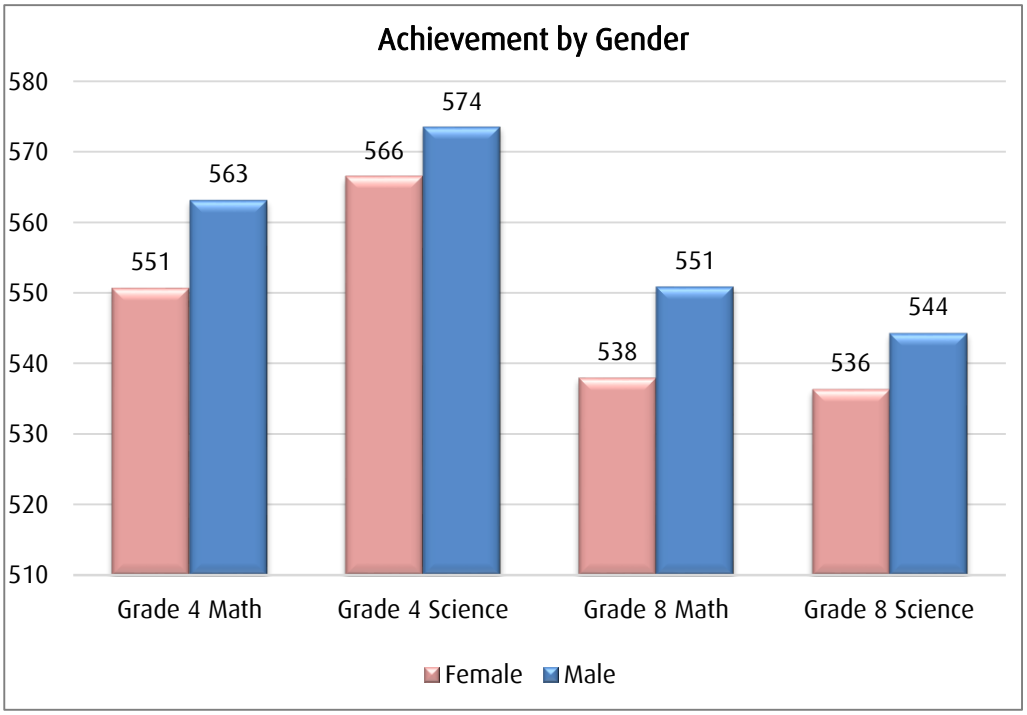
The chart below compares *your* students' scores in the last two cycles of TIMSS



How does achievement at your school vary by gender?

This bar chart indicates the performance of female and male in your school

Gender	Female students	Male students
Number of students in Grade 4	22	18
Number of students in Grade 8	20	24



Achievement in the Content and Cognitive Domains

TIMSS student achievement results can be broken down into achievement by either content or cognitive domains. The content domains are three subject matter domains while cognitive domains are sets of skills required across different content domains in TIMSS. The content and the cognitive domains are accordingly designed and distributed as follows:

Mathematics Content Domains

Grade 4	Topic areas	Target %	Grade 8	Topic areas	Target %
Number	• Whole numbers • Fractions and decimals • Number sentences with whole numbers • Patterns and relationships	50%	**Number**	• Whole numbers • Fractions and decimals • Integers • Ratio, proportion and percent	30%
Geometric Shapes and Measures	• Points, lines and angles • Two-and three-dimensional shapes	35%	**Algebra**	• Patterns • Algebraic expressions • Equations/formulas and functions	30%
Data Display	• Reading and interpreting • Organizing and representing	15%	**Geometry**	• Geometric shapes • Geometric measurement • Location and movement	20%
			Data and Chance	Data organisation and representation Data interpretation Chance	20%

Mathematics Cognitive Domains

Domains	Grade 4	Grade 8
Knowing	40%	35%
Applying	40%	40%
Reasoning	20%	25%

Science Content Domains

Grade 4	Topic areas	Target %	Grade 8	Topic areas	Target %
Life Science	• Characteristics and life process of living things • Interaction with the environment • Ecosystems • Human health	45%	**Biology**	• Characteristics classification, and life processes of organisms • Cells and their functions • Life cycles, reproduction, and heredity • Diversity, adaptation, and natural selection • Ecosystems • Human Health	35%
Physical Science	• Classification and properties of matter • Forces and motion • Sources and effects of energy	35%	**Chemistry**	• Classification and composition of matter • Properties of matter • Chemical Change	20%
Earth Science	• Earth's Structure, physical characteristics and resources • Earth's processes, cycles, and history • Earth in the solar system	20%	**Physics**	• Physical states and changes in matter • Energy transformations, heat, and temperature • Light and sound • Electricity and magnetism • Forces and motion	25%
			Earth Science	• Earth's structure and physical features • Earth's processes, cycles, and history • Earth's resources, their use and conservation • Earth in the solar system and the universe	20%

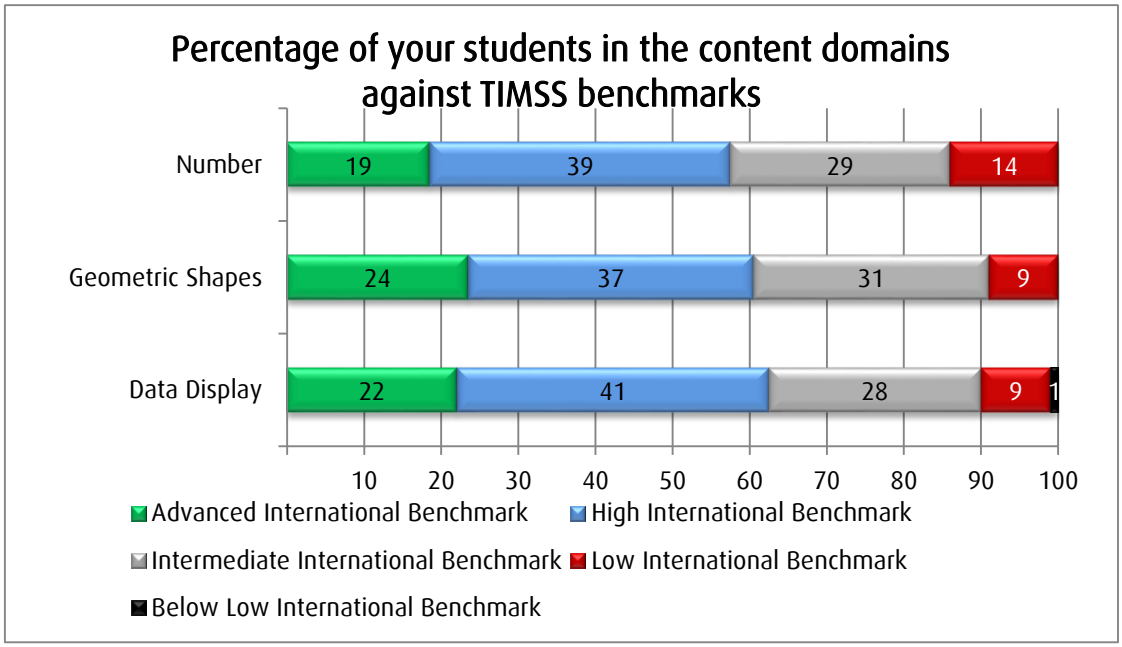
Science Cognitive Domains

Domains	Grade 4	Grade 8
Knowing	40%	35%
Applying	40%	35%
Reasoning	20%	30%

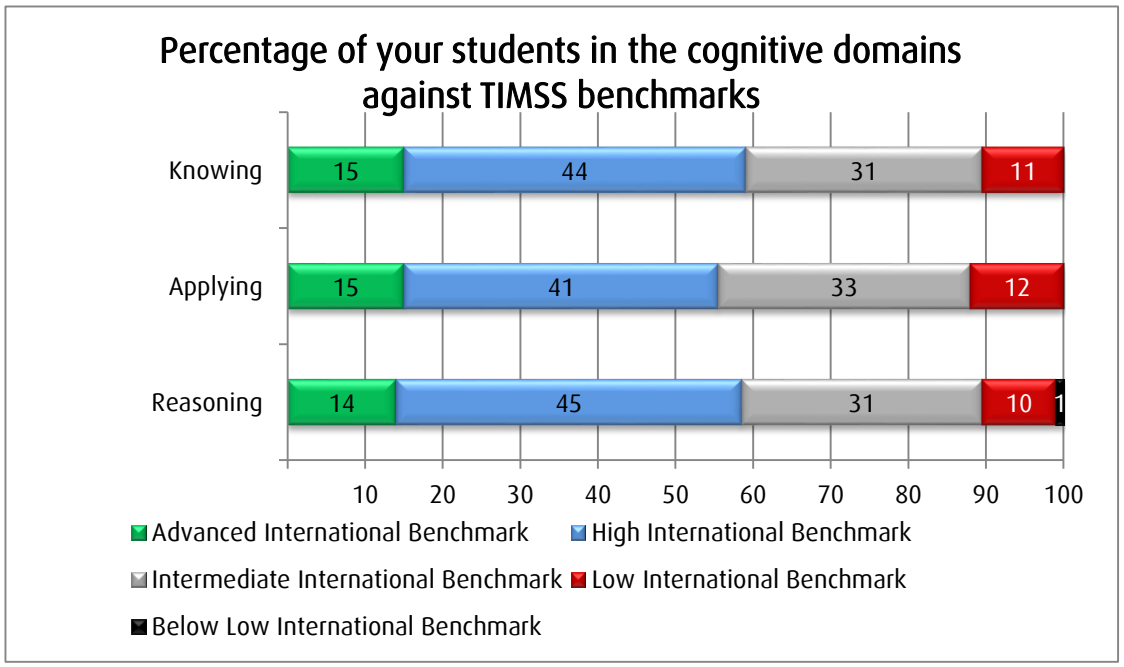
How well did *your* students achieve in each of the Content and Cognitive Domains?

Grade 4 - Mathematics

TIMSS	Content Domain			Cognitive Domain		
Grade 4	Number	Geometric Shapes	Data Display	Knowing	Applying	Reasoning
Average score of your students	561	571	571	559	555	556
Overall average of Dubai private schools	524	512	527	525	520	517



*The total values might not add up to 100% due to rounding

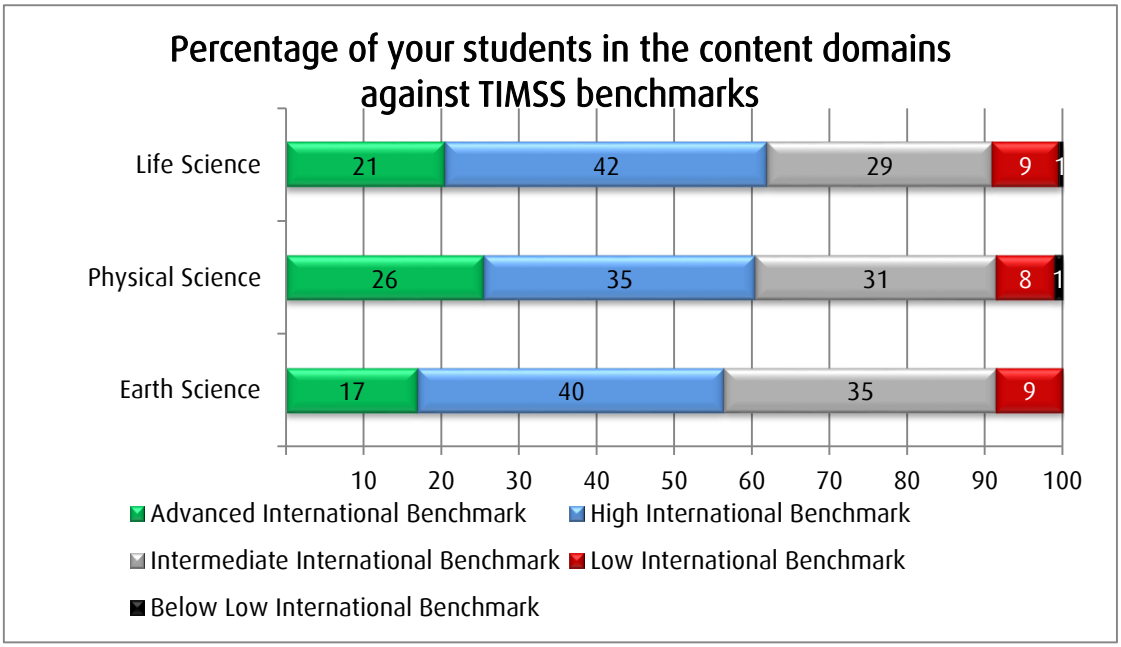


*The total values might not add up to 100% due to rounding

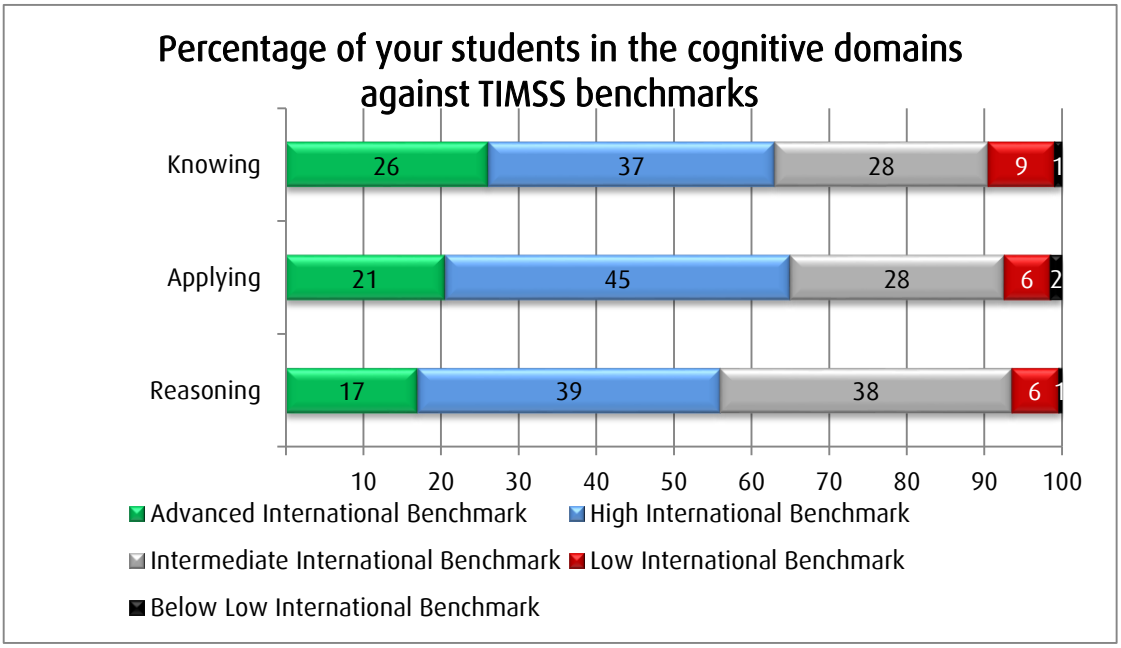
How well did *your* students achieve in each of the Content and Cognitive Domains?

Grade 4 - Science

TIMSS	Content Domain			Cognitive Domain		
Grade 4	Life Science	Physical Science	Earth Science	Knowing	Applying	Reasoning
Average score of your students	572	572	566	576	572	564
Overall average of Dubai private schools	531	532	522	535	529	523



*The total values might not add up to 100% due to rounding

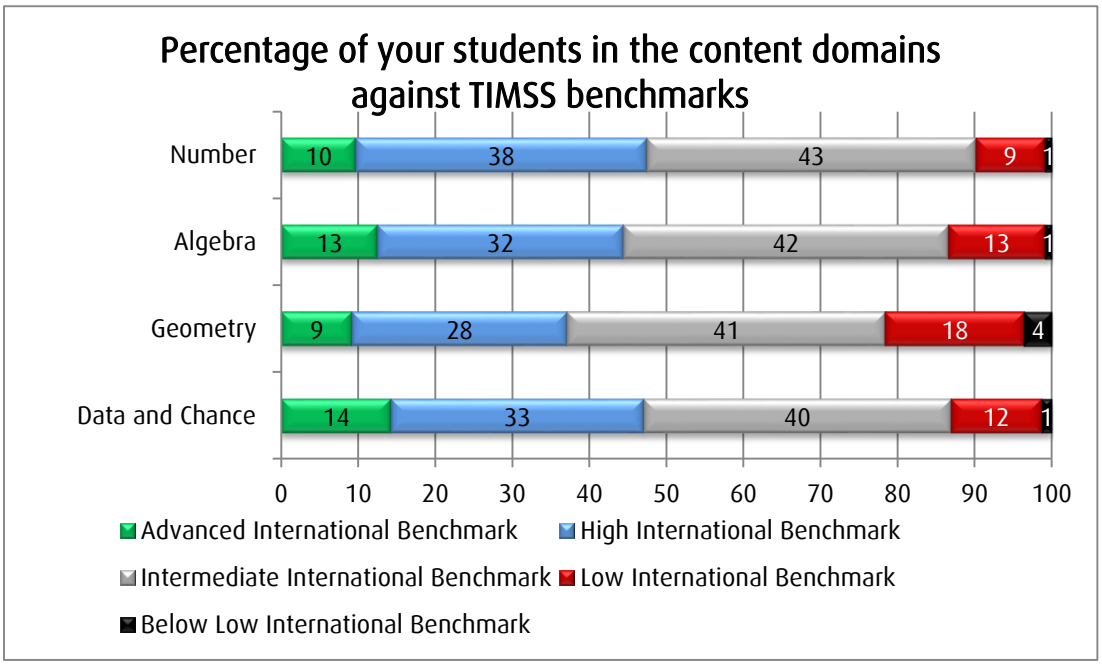


*The total values might not add up to 100% due to rounding

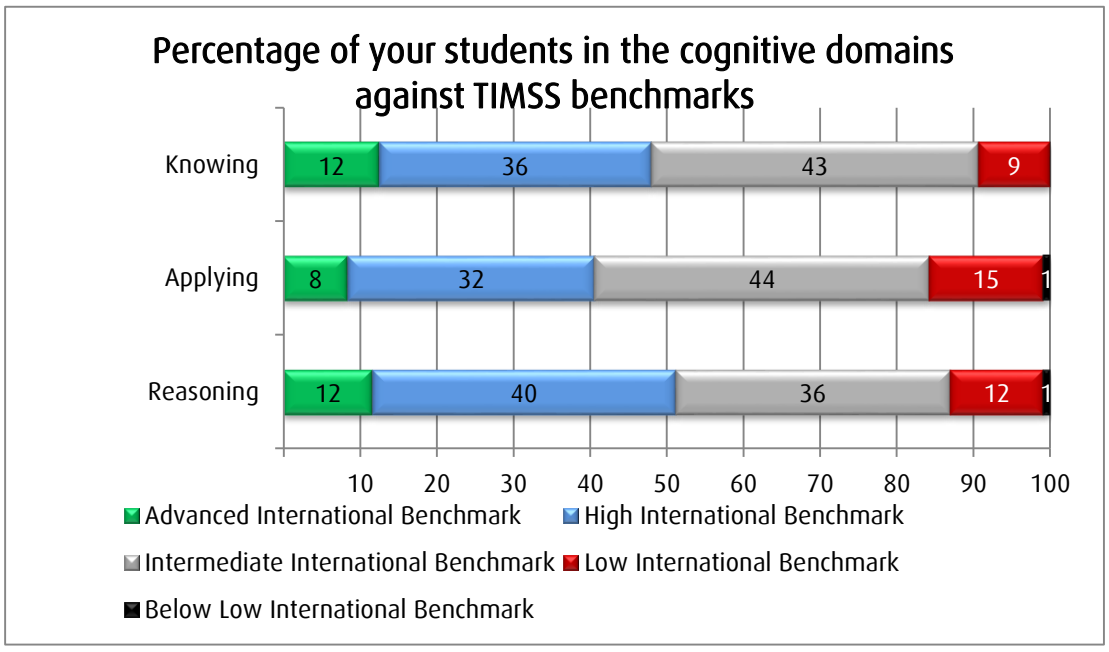
How well did *your* students achieve in each of the Content and Cognitive Domains?

Grade 8 - Mathematics

TIMSS	Content Domain				Cognitive Domain		
Grade 8	Number	Algebra	Geometry	Data and Chance	Knowing	Applying	Reasoning
Average score of your students	549	547	529	552	554	537	551
Overall average of Dubai private schools	521	541	509	517	533	518	522



*The total values might not add up to 100% due to rounding

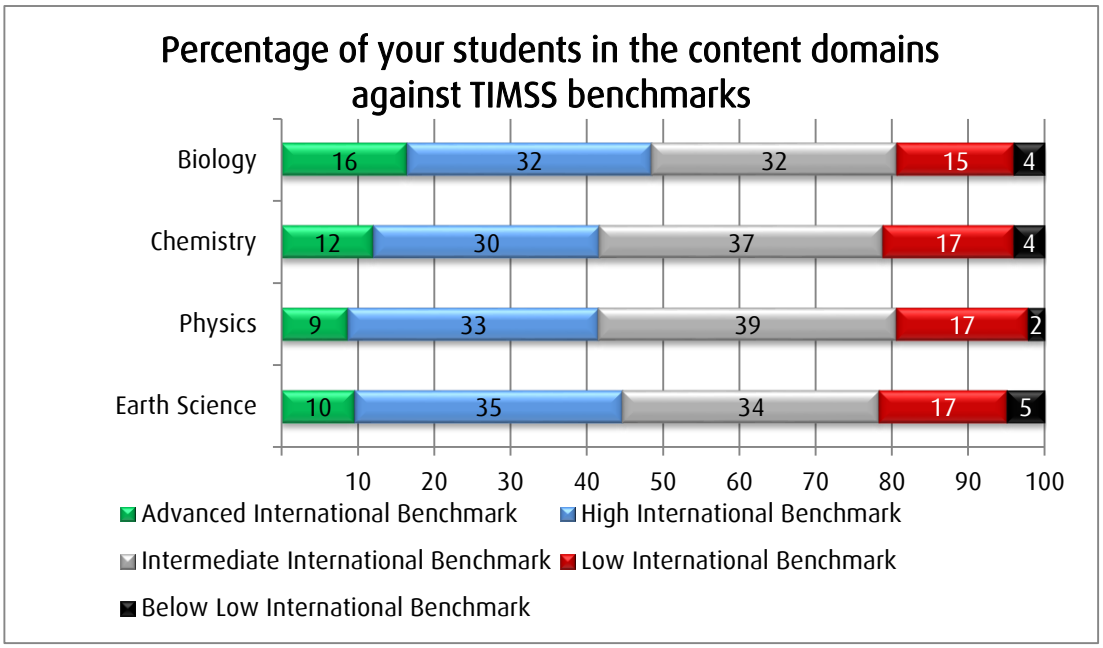


*The total values might not add up to 100% due to rounding

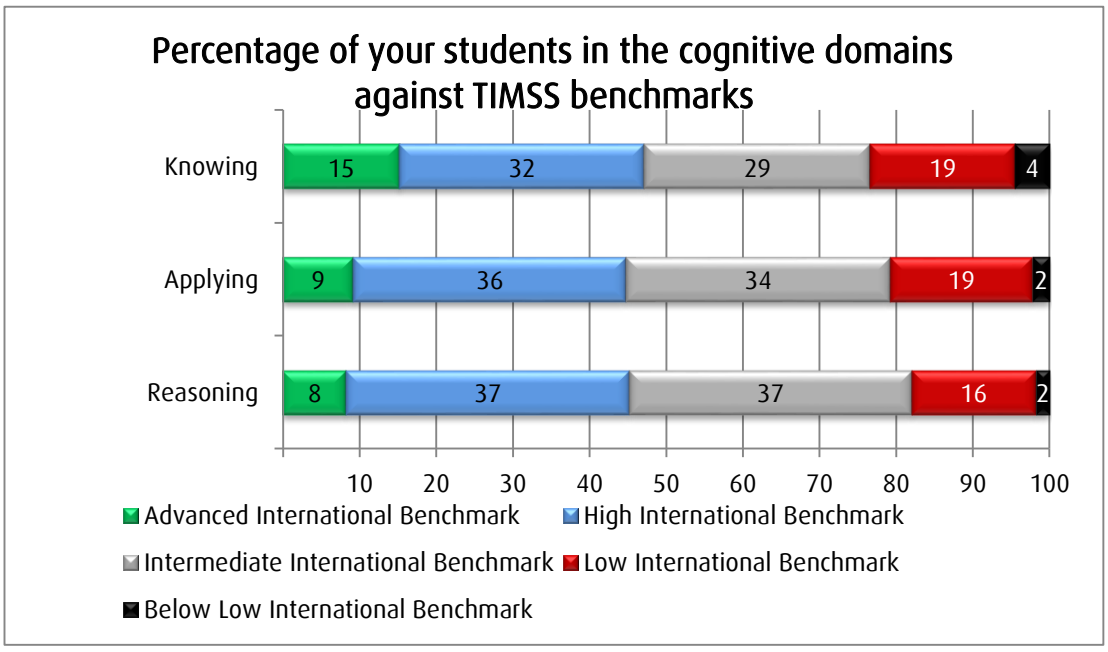
How well did *your* students achieve in each of the Content and Cognitive Domains?

Grade 8 - Science

TIMSS	Content Domain				Cognitive Domain		
Grade 8	Biology	Chemistry	Physics	Earth Science	Knowing	Applying	Reasoning
Average score of your students	542	533	535	533	536	536	536
Overall average of Dubai private schools	538	541	539	530	540	538	533



*The total values might not add up to 100% due to rounding



*The total values might not add up to 100% due to rounding

The performance of Emirati students in your school

The standards of achievement of Emirati students is a very high priority for KHDA. The table below outlines the difference in achievement between Emiratis and expatriate students in your school.

As KHDA continues to prioritise improving the knowledge acquisition and skills development of Emirati students, it is important for schools to work towards improving the overall academic performance of this cohort by identifying ways to improve their levels of achievement in all domains.

Through strategic evaluation and planning and subsequent adaptations to the curriculum and pedagogy, schools must make provision to ensure that Emirati and expatriate students alike go on to make the highest levels of progress in mathematics, science and reading.

Grade 4

Nationality	Overall Score in Mathematics	Overall Score in Science
Emirati students in your school		
Expatriates students in your school		
Emirati students in private Schools	459	454
2019 TIMSS Dubai Target Scores for Emirati Students	489	484

Grade 8

Nationality	Overall Score in Mathematics	Overall Score in Science
Emirati students in your school		
Expatriates students in your school		
Emirati students in private Schools	458	462
2019 TIMSS Dubai Target Scores for Emirati Students	488	492

*** Note : there is no comparison of Emirati students against Expatriate student if less than 5 Emirati students for comparision in sample tested because of data restriction

Appendix

Descriptions of the International Benchmarks

Grade 4 - Mathematics
Advanced International Benchmark- 625
Students can apply their understanding and knowledge in a variety of relatively complex situations and explain their reasoning. They can solve a variety of multi-step word problems involving whole numbers including proportions. Students at this level show an increasing understanding of fractions and decimals. Students can apply geometric knowledge of a range of two- and three-dimensional shapes in a variety of situations. They can draw a conclusion from data in a table and justify their conclusion.
High International Benchmark- 550
Students can apply their knowledge and understanding to solve problems. Students can solve word problems involving operations with whole numbers. They can use division in a variety of problem situations. They can use their understanding of place value to solve problems. Students can extend patterns to find a later specified term. Students demonstrate understanding of line symmetry and geometric properties. Students can interpret and use data in tables and graphs to solve problems. They can use information in pictographs and tally charts to complete bar graphs.
Intermediate International Benchmark- 475
Students can apply basic mathematical knowledge in straightforward situations. Students at this level demonstrate an understanding of whole numbers and some understanding of fractions. Students can visualise three-dimensional shapes from two-dimensional representations. They can interpret bar graphs, pictographs, and tables to solve simple problems.
Low International Benchmark-400
Students have some basic mathematical knowledge. Students can add and subtract whole numbers. They have some recognition of parallel and perpendicular lines, familiar geometric shapes, and coordinate maps. They can read and complete simple bar graphs and tables.

Grade 8 - Mathematics
Advanced International Benchmark- 625
Students can reason with information, draw conclusions, make generalisations, and solve linear equations. Students can solve a variety of fraction, proportion, and percent problems and justify their conclusions. Students can express generalisations algebraically and model situations. They can solve a variety of problems involving equations, formulas, and functions. Students can reason with geometric figures to solve problems. Students can reason with data from several sources or unfamiliar representations to solve multi-step problems.
High International Benchmark- 550
Students can apply their understanding and knowledge in a variety of relatively complex situations. Students can use information from several sources to solve problems involving different types of numbers and operations. Students can relate fractions, decimals, and per cents to each other. Students at this level show basic procedural knowledge related to algebraic expressions. They can use properties of lines, angles, triangles, rectangles, and rectangular prisms to solve problems. They can analyze data in a variety of graphs.
Intermediate International Benchmark- 475
Students can apply basic mathematical knowledge in a variety of situations. Students can solve problems involving decimals, fractions, proportions, and percentages. They understand simple algebraic relationships. Students can relate a two-dimensional drawing to a three-dimensional object. They can read, interpret, and construct graphs and tables. They recognize basic notions of likelihood.
Low International Benchmark-400
Students have some knowledge of whole numbers and decimals, operations, and basic graphs.

Grade 4 - Science

Advanced International Benchmark- 625

Students apply knowledge and understanding of scientific processes and relationships and show some knowledge of the process of scientific inquiry. Students communicate their understanding of characteristics and life processes of organisms, reproduction and development, ecosystems and organisms' interactions with the environment, and factors relating to human health. They demonstrate understanding of properties of light and relationships among physical properties of materials, apply and communicate their understanding of electricity and energy in practical contexts, and demonstrate an understanding of magnetic and gravitational forces and motion. Students communicate their understanding of the solar system and of Earth's structure, physical characteristics, resources, processes, cycles, and history. They have a beginning ability to interpret results in the context of a simple experiment, reason and draw conclusions from descriptions and diagrams, and evaluate and support an argument.

High International Benchmark- 550

Students apply their knowledge and understanding of the sciences to explain phenomena in everyday and abstract contexts. Students demonstrate some understanding of plant and animal structure, life processes, life cycles, and reproduction. They also demonstrate some understanding of ecosystems and organisms' interactions with their environment, including understanding of human responses to outside conditions and activities. Students demonstrate understanding of some properties of matter, electricity and energy, and magnetic and gravitational forces and motion. They show some knowledge of the solar system, and of Earth's physical characteristics, processes, and resources. Students demonstrate elementary knowledge and skills related to scientific inquiry. They compare, contrast, and make simple inferences, and provide brief descriptive responses combining knowledge of science concepts with information from both every day and abstract contexts.

Intermediate International Benchmark- 475

Students have basic knowledge and understanding of practical situations in the sciences. Students recognise some basic information related to characteristics of living things, their reproduction and life cycles, and their interactions with the environment, and show some understanding of human biology and health. They also show some knowledge of properties of matter and light, electricity and energy, and forces and motion. Students know some basic facts about the solar system and show an initial understanding of Earth's physical characteristics and resources. They demonstrate ability to interpret information in pictorial diagrams and apply factual knowledge to practical situations.

Low International Benchmark-400

Students show some elementary knowledge of life, physical, and earth sciences. Students demonstrate knowledge of some simple facts related to human health, ecosystems, and the behavioral and physical characteristics of animals. They also demonstrate some basic knowledge of energy and the physical properties of matter. Students interpret simple diagrams, complete simple tables, and provide short written responses to questions requiring factual information.

Grade 8 - Science

Advanced International Benchmark- 625

Students communicate an understanding of complex and abstract concepts in biology, chemistry, physics, and earth science. Students demonstrate some conceptual knowledge about cells and the characteristics, classification, and life processes of organisms. They communicate an understanding of the complexity of ecosystems and adaptations of organisms, and apply an understanding of life cycles and heredity. Students also communicate an understanding of the structure of matter and physical and chemical properties and changes and apply knowledge of forces, pressure, motion, sound, and light. They reason about electrical circuits and properties of magnets. Students apply knowledge and communicate understanding of the solar system and Earth's processes, structures, and physical features. They understand basic features of scientific investigation. They also combine information from several sources to solve problems and draw conclusions, and they provide written explanations to communicate scientific knowledge.

High International Benchmark- 550

Students demonstrate understanding of concepts related to science cycles, systems, and principles. They demonstrate understanding of aspects of human biology, and of the characteristics, classification, and life processes of organisms. Students communicate understanding of processes and relationships in ecosystems. They show an understanding of the classification and compositions of matter and chemical and physical properties and changes. They apply knowledge to situations related to light and sound and demonstrate basic knowledge of heat and temperature, forces and motion, and electrical circuits and magnets. Students demonstrate an understanding of the solar system and of Earth's processes, physical features, and resources. They demonstrate some scientific inquiry skills. They also combine and interpret information from various types of diagrams, contour maps, graphs, and tables; select relevant information, analyse, and draw conclusions; and provide short explanations conveying scientific knowledge.

Intermediate International Benchmark- 475

Students recognize and apply their understanding of basic scientific knowledge in various contexts. Students apply knowledge and communicate an understanding of human health, life cycles, adaptation, and heredity, and analyse information about ecosystems. They have some knowledge of chemistry in everyday life and elementary knowledge of properties of solutions and the concept of concentration. They are acquainted with some aspects of force, motion, and energy. They demonstrate an understanding of Earth's processes and physical features, including the water cycle and atmosphere. Students interpret information from tables, graphs, and pictorial diagrams and draw conclusions. They apply knowledge to practical situations and communicate their understanding through brief descriptive responses.

Low International Benchmark-400

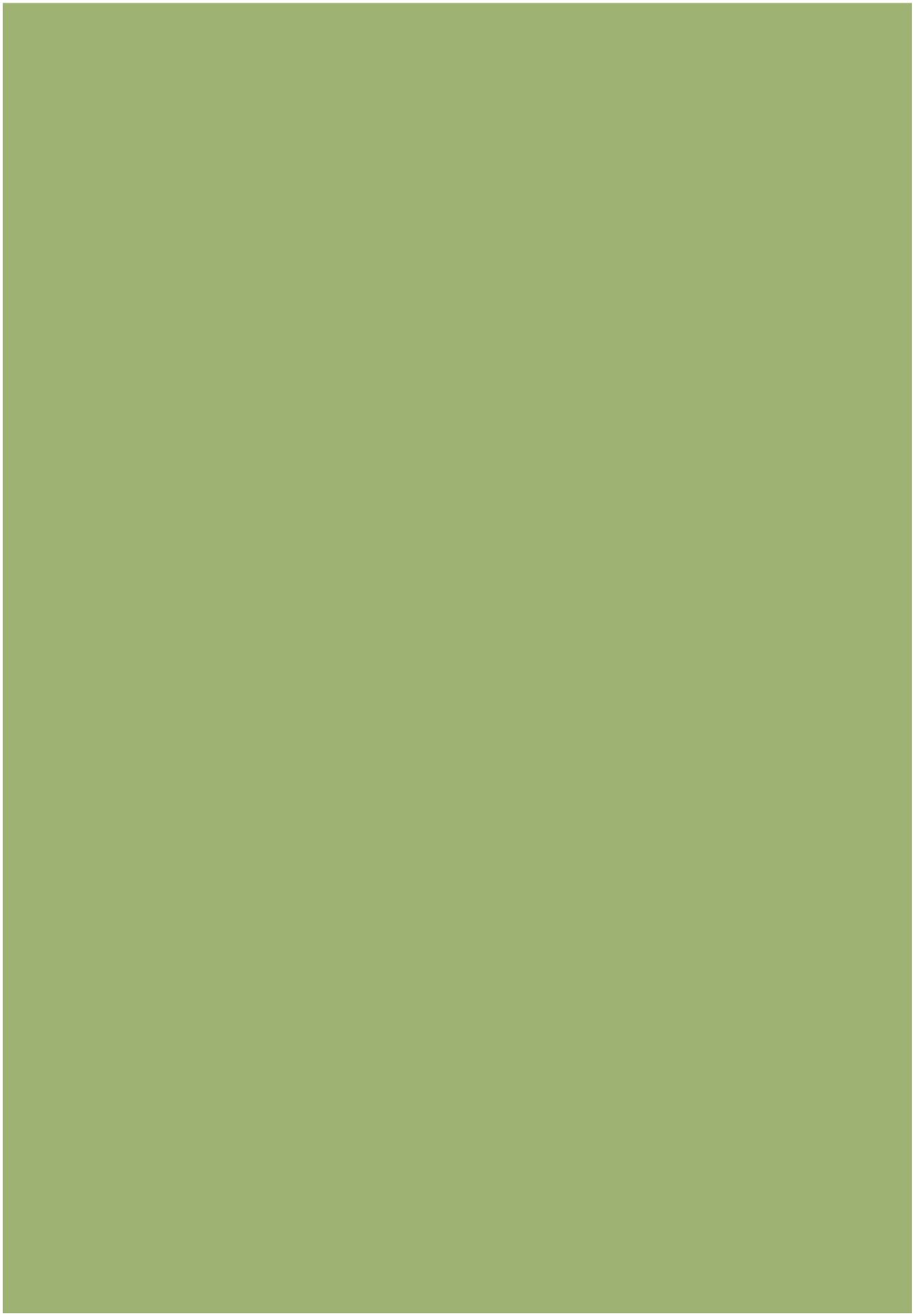
Students can recognize some basic facts from the life and physical sciences. They have some knowledge of biology, and demonstrate some familiarity with physical phenomena. Students interpret simple pictorial diagrams, complete simple tables, and apply basic knowledge to practical situations.

For more information about Dubai's participation in TIMSS 2015, please check :

https://www.khda.gov.ae/en/publications

How to contact us:

If you have a concern or wish to comment on any aspect of this report you should contact:
International.assessments@khda.gov.ae



Knowledge and Human Development Authority
P. O. Box: 500008, Dubai, United Arab Emirates
Tel: +971 4 364 0000 Fax: +971 4 364 0001
www.khda.gov.ae