

**TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE
STUDY (TIMSS 2019) FIELD TEST**

OMB# 1850-0695 v.11

APPENDIX C.1

TIMSS Field Test Questionnaires – Summary of Changes

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APPENDIX C.1: SUMMARY OF CHANGES TO U.S. TIMSS INSTRUMENTS FROM TIMSS 2015 MAIN STUDY TO TIMSS 2019 FIELD TEST

The International Association for the Evaluation of Education Achievement (IEA) has released the final international versions of the TIMSS 2019 field test questionnaires, and is in the process of approving the adaptations to be made to the U.S. versions of the field test questionnaires. This appendix, Appendix C.1, lists the changes that were made to the TIMSS 2019 U.S. versions of the field test questionnaire from the last round of TIMSS (TIMSS 2015). Appendix C.2 provides the draft U.S. adapted versions of the TIMSS 2019 field test questionnaires to be administered in spring 2018. Appendix C.1 is based on a comparison of the draft TIMSS 2019 U.S. field test questionnaires with the final U.S. versions of the TIMSS 2015 main study questionnaires, which were included in the last TIMSS 2019 Main Study Recruitment and Field Test submission (OMB# 1850-0695 v.10) because the TIMSS 2019 field test international questionnaires were not yet available. If any changes are made to the U.S. adaptations provided in this submission, the final versions of the adapted U.S. versions of the TIMSS 2019 field test questionnaires will be provided to OMB as a change request in January 2018.

The changes detailed in this appendix (C.1) are listed first by grade, then by questionnaire (e.g., school principal, teacher, and student), and lastly by the four types of changes made: new U.S. adaptations (not already included in the 2015 main study); new TIMSS items; deleted TIMSS items; and revisions to TIMSS item wording (made for the TIMSS 2019 field test administration).

The U.S. adaptations that were already made to the TIMSS 2015 main study version of the questionnaires are kept for the TIMSS 2019 field test version. New U.S. adaptations for the field test refer to any changes that need to be made for the TIMSS 2019 field test version, such as the year of the test in the questionnaire introduction. The U.S. also kept the same national questions as were used in TIMSS 2015 without modifications in order to continue to provide data for the U.S. context. Based on analysis of the TIMSS 2015 main study data, the IEA and the international contractors revised some of the items from the 2015 international versions of the questionnaires, added some new items, and also deleted some of the 2015 items. All of these changes are listed in this document. Straightforward adaptations of U.K. English to American English (e.g., favourite to favorite; adding a comma after “e.g.”; or removal of ® registered trademark symbols) were applied throughout each questionnaire and are not included in the tables below.

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A. Principal Questionnaire – Grade 4

1. New Adaptations of all items (not already included in the U.S. 2015 main study version)

| TIMSS 2019 U.S. Field Test (draft) | | |
|--|--|----------------------------------|
| 2015 U.S. adaptation | 2019 Field Test U.S. adaptation | Item(s) |
| <p>Your school has agreed to participate in TIMSS 2015 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide.</p> | <p>Your school has agreed to participate in TIMSS 2019 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide.</p> | <p><i>Note: Year updated</i></p> |
| <p>Q1</p> <p>What is the total enrollment of students in your school as of March 1, 2015?</p> <p>_____ students</p> <p><i>Write in the number.</i></p> | <p>Q1</p> <p>What is the total enrollment of students in your school as of March 1, 2018?</p> <p>_____ students</p> <p><i>Write in the number.</i></p> | <p><i>Note: Updated date</i></p> |
| <p>Q2</p> <p>What is the total enrollment of fourth-grade students in your school as of March 1, 2015?</p> <p>_____ students</p> <p><i>Write in the number.</i></p> | <p>Q2</p> <p>What is the total enrollment of fourth-grade students in your school as of March 1, 2018?</p> <p>_____ students</p> <p><i>Write in the number.</i></p> | <p><i>Note: Updated date</i></p> |
| <p>Q4</p> <p>Around the 1st of October 2014, what percentage of students at this school were eligible to receive free or reduced-price lunches through the National School Lunch Program?</p> <p>_____ percentage of students</p> <p><i>Write in the number.</i></p> | <p>Q4</p> <p>Around the 1st of October 2017, what percentage of students at this school were eligible to receive free or reduced-price lunches through the National School Lunch Program?</p> <p>_____ percentage of students</p> <p><i>Write in the number.</i></p> | <p><i>Note: Updated date</i></p> |

2. New Items

| Item # | Added Text/Item |
|--------|--|
| Q14 | <p>Does your school provide students access to digital learning resources (e.g., books, videos)?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Yes • No |

3. Deleted Items (entire stem)

| Item Number | Deleted Item |
|-------------|---|
| Q10 | <p>Does your school provide free meals for students?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Yes, for all students • Yes, for some students • No <p style="margin-left: 40px;">a) Breakfast b) Lunch</p> |
| Q11 | <p>To what degree are the following health topics emphasized in your school?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low <p style="margin-left: 40px;">a) Washing hands b) Brushing teeth c) A healthy diet/nutrition d) Disease prevention</p> |
| Q13A | <p>Does your school provide a place where students can work on their schoolwork before or after school?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Yes • No • (If No, go to #14) |
| Q13B | <p>If Yes, Is someone available to assist them with their schoolwork?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Yes • No |
| Q14 | <p>As a general school policy, is student achievement used to assign fourth-grade students to classes (e.g., streaming, tracking, setting)?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Yes • No |

| Item Number | Deleted Item |
|-------------|--|
| | <p>a) For Mathematics b) For Science</p> |

4. Revised Items

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|--|---|--|--|
| Item # | Original Item | Item # | Revised Item |
| Q12 Q15 Q16 Q17 Q18 Q19 Q20 Q21 Q22 Q23 Q24 Q25 Q26 Q27 | | Q10 Q11 Q12 Q13 Q15 Q16 Q17 Q18 Q19 Q20 Q21 Q22 Q23 Q24 | <i>Note: Renumbered items</i> |
| Q17A | <p>If Yes, Approximately how many books (print and digital) with different titles does your school library have (exclude magazines and periodicals)?</p> <p><i>Fill in one circle for each column.</i></p> <p>a) Print</p> <ul style="list-style-type: none"> • 250 or fewer • 251–500 • 501–2,000 • 2,001–5,000 • 5,001–10,000 • More than 10,000 <p>b) Digital</p> <ul style="list-style-type: none"> • 0 • 1–5 • 6–10 • 11–30 • 31 or more | Q13A Q13B | <p><i>Note: Question stem structure removed part of the question.</i></p> <p>If Yes, Approximately how many books (print) with different titles does your school library have (exclude magazines and periodicals)?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • 250 or fewer • 251–500 • 501–2,000 • 2,001–5,000 • 5,001–10,000 • More than 10,000 <p>Approximately how many titles of magazines and other periodicals (print) does your school library have?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • 0 • 1–5 • 6–10 • 11–30 • 31 or more |
| Q19 | <p>How would you characterize each of the following within your school?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium | Q16 | <p><i>Note: Two dimensions removed</i></p> <p>How would you characterize each of the following within your school?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium |

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|--|----------------------------|---|
| Item # | Original Item | Item # | Revised Item |
| | <ul style="list-style-type: none"> • Low • Very low <ol style="list-style-type: none"> a) Teachers' understanding of the school's curricular goals b) Teachers' degree of success in implementing the school's curriculum c) Teachers' expectations for student achievement d) Teachers working together to improve student achievement e) Teachers' ability to inspire students f) Parental involvement in school activities g) Parental commitment to ensure that students are ready to learn h) Parental expectations for student achievement i) Parental support for student achievement j) Parental pressure for the school to maintain high academic standards k) Students' desire to do well in school l) Students' ability to reach school's academic goals m) Students' respect for classmates who excel in school | | <ul style="list-style-type: none"> • Low • Very low <ol style="list-style-type: none"> a) Teachers' understanding of the school's curricular goals b) Teachers' degree of success in implementing the school's curriculum c) Teachers' expectations for student achievement d) Teachers' ability to inspire students e) Parental involvement in school activities f) Parental commitment to ensure that students are ready to learn g) Parental expectations for student achievement h) Parental support for student achievement i) Students' desire to do well in school j) Students' ability to reach school's academic goals k) Students' respect for classmates who excel academically |
| Q23 | <p>About how many of the students in your school can do the following when they begin the first grade of primary/elementary school?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Less than 25% • 25–50% • 51–75% • More than 75% <ol style="list-style-type: none"> a) Recognize most of the letters of the alphabet b) Read some words c) Read sentences d) Write letters of the alphabet e) Write some words f) Count up to 100 or higher g) Recognize written numbers from 1-10 h) Recognize written numbers higher than 10 i) Write numbers from 1-10 j) Do simple addition k) Do simple subtraction | Q20 | <p><i>Note: One dimension added, one dimension revised</i></p> <p>About how many of the students in your school can do the following when they begin the first grade of primary/elementary school?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Less than 25% • 25–50% • 51–75% • More than 75% <ol style="list-style-type: none"> a) Recognize most of the letters of the alphabet b) Read some words c) Read sentences d) Write letters of the alphabet e) Write their names f) Write words other than their names g) Count up to 100 or higher h) Recognize written numbers from 1-10 i) Recognize written numbers higher than 10 j) Write numbers from 1-10 k) Do simple addition l) Do simple subtraction |
| Q27 | | Q24 | <i>Note: One dimension added</i> |

APPENDIX C.1: SUMMARY OF U.S. CHANGES TO TIMSS INSTRUMENTS

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|--|----------------------------|--|
| Item # | Original Item | Item # | Revised Item |
| | <p>Do you hold the following qualifications or credentials in educational leadership? <i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Yes • No <p>a) Master's degree or professional degree (MD, DDS, lawyer, minister) b) Doctorate (Ph.D. or Ed.D.)</p> | | <p>Do you hold the following qualifications or credentials in educational leadership? <i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Yes • No <p>a) Principal Certification b) Master's degree or professional degree (MD, DDS, lawyer, minister) c) Doctorate (Ph.D. or Ed.D.)</p> |

B. Teacher Questionnaire – Grade 4

1. New Adaptations of all items (not already included in the U.S. 2015 main study version)

| TIMSS 2019 U.S. Field Test (draft) | | |
|---|---|---------------------------|
| 2015 U.S. adaptation | 2019 Field Test U.S. adaptation | Item(s) |
| Your school has agreed to participate in TIMSS 2015 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide. | Your school has agreed to participate in TIMSS 2019 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide. | <i>Note: Year updated</i> |

2. New Items

| Item # | Added Text/Item |
|-------------|--|
| Q22 | <p>About how often do fourth-grade students in this class take mathematics tests on computers or tablets?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • More than once a month • Once a month • Twice a year • Once a year or less • Never |
| Q32 | <p>About how often do fourth-grade students in this class take science tests on computers or tablets?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • More than once a month • Once a month • Twice a year • Once a year or less • Never |
| Q23 and Q33 | <p>To what extent do you depend on assessment results?</p> <p><i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • A lot • Some • A little • None <p>a) To modify your instruction b) To give grades c) To report to parents</p> |

| |
|--|
| d) To determine the learning needs of each student |
|--|

3. Deleted Items (entire stem)

| Item # | Deleted Text/Item |
|--------|---|
| Q9 | <p>In your current school, how severe is each problem? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Not a problem • Minor problem • Moderate problem • Serious problem <p>a) The school building needs significant repair b) Teachers do not have adequate workspace (e.g., for preparation, collaboration, or meeting with students) c) Teachers do not have adequate instructional materials and supplies d) The school classrooms are not cleaned often enough e) The school classrooms need maintenance work f) Teachers do not have adequate technological resources g) Teachers do not have adequate support for using technology</p> |
| Q10 | <p>How often do you have the following types of interactions with other teachers? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very Often • Often • Sometimes • Never or almost never <p>a) Discuss how to teach a particular topic b) Collaborate in planning and preparing instructional materials c) Share what I have learned about my teaching experiences d) Visit another classroom to learn more about teaching e) Work together to try out new ideas f) Work as a group on implementing the curriculum g) Work with teachers from other grades to ensure continuity in learning</p> |
| Q18 | <p>In teaching mathematics to this class, how would you characterize your confidence in doing the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low <p>a) Inspiring students to learn mathematics b) Showing students a variety of problem solving strategies c) Providing challenging tasks for the highest achieving students d) Adapting my teaching to engage students' interest e) Helping students appreciate the value of learning mathematics f) Assessing student comprehension of mathematics g) Improving the understanding of struggling students h) Making mathematics relevant to students i) Developing students' higher-order thinking skills</p> |
| Q27 | <p>How well prepared do you feel you are to teach the following mathematics topics? If a topic is not in the <u>fourth-grade</u> curriculum or you are not responsible for teaching this topic, please choose "Not applicable." <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Not applicable |

| | |
|-------------------|--|
| | <ul style="list-style-type: none"> • Very well prepared • Somewhat prepared • Not well prepared <p style="text-align: center;">Number</p> <ul style="list-style-type: none"> a) Concepts of whole numbers, including place value and ordering b) Adding, subtracting, multiplying, and/or dividing with whole numbers c) Concepts of multiples and factors; odd and even numbers d) Concepts of fractions (fractions as parts of a whole or of a collection, or as a location on a number line) e) Adding and subtracting with fractions, comparing and ordering fractions f) Concepts of decimals, including place value and ordering, adding and subtracting with decimals g) Number sentences (finding the missing number, modeling simple situations with number sentences) h) Number patterns (extending number patterns and finding missing terms) <p style="text-align: center;">Geometric Shapes and Measures</p> <ul style="list-style-type: none"> i) Lines: measuring, estimating length of; parallel and perpendicular lines j) Comparing and drawing angles k) Using informal coordinate systems to locate points in a plane (e.g., in square B4) l) Elementary properties of common geometric shapes m) Reflections and rotations n) Relationships between two-dimensional and three-dimensional shapes o) Finding and estimating areas, perimeters, and volumes <p style="text-align: center;">Data Display</p> <ul style="list-style-type: none"> p) Reading and representing data from tables, pictographs, bar graphs, or pie charts q) Drawing conclusions from data displays |
| <p>Q29</p> | <p>In teaching science to this class, how would you characterize your confidence in doing the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low <ul style="list-style-type: none"> a) Inspiring students to learn science b) Explaining science concepts or principles by doing science experiments c) Providing challenging tasks for the highest achieving students d) Adapting my teaching to engage students' interest e) Helping students appreciate the value of learning science f) Assessing student comprehension of science g) Improving the understanding of struggling students h) Making science relevant to students i) Developing students' higher-order thinking skills j) Teaching science using inquiry methods |
| <p>Q37</p> | <p>How well prepared do you feel you are to teach the following science topics? If a topic is not in the <u>fourth-grade</u> curriculum or you are not responsible for teaching this topic, please choose "Not applicable." <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Not applicable • Very well prepared • Somewhat prepared • Not well prepared <p style="text-align: center;">Life Science</p> <ul style="list-style-type: none"> a) Characteristics of living things and the major groups of living things (e.g., mammals, birds, insects, flowering plants) b) Major body structures and their functions in humans, other animals, and plants c) Life cycles of common plants and animals (e.g., humans, butterflies, frogs, flowering plants) d) Understanding that some characteristics are inherited and some are the result of the environment |

- e) How physical features and behaviors help living things survive in their environments
- f) Relationships in communities and ecosystems (e.g., simple food chains, predator-prey relationships, human impacts on the environment)
- g) Human health (transmission and prevention of diseases, symptoms of health and illness, importance of a healthy diet and exercise)

Physical Science

- h) States of matter (solid, liquid, gas) and properties of the states of matter (volume, shape); how the state of matter changes by heating or cooling
- i) Classifying materials based on physical properties (e.g., weight/mass, volume, conducting heat, conducting electricity, magnetic attraction)
- j) Mixtures and how to separate a mixture into its components (e.g., sifting, filtering, evaporation, using a magnet)
- k) Chemical changes in everyday life (e.g., decaying, burning, rusting, cooking)
- l) Common sources of energy (e.g., the Sun, electricity, wind) and uses of energy (heating and cooling homes, providing light)
- m) Light and sound in everyday life (e.g., understanding shadows and reflection, understanding that vibrating objects make sound)
- n) Electricity and simple circuits (e.g., identifying materials that are conductors, recognizing that electricity can be changed to light or sound, knowing that a circuit must be complete to work correctly)
- o) Properties of magnets (e.g., knowing that like poles repel and opposite poles attract, recognizing that magnets can attract some objects)
- p) Forces that cause objects to move (e.g., gravity, pushing/pulling)

Earth Science

- q) Common features of the Earth's landscape (e.g., mountains, plains, deserts, rivers, oceans) and their relationship to human use (farming, irrigation, land development)
- r) Where water is found on the Earth and how it moves in and out of the air (e.g., evaporation, rainfall, cloud formation, dew formation)
- s) Understanding that weather can change from day to day, from season to season, and by geographic location
- t) Understanding what fossils are and what they can tell us about past conditions on Earth
- u) Objects in the solar system (the Sun, the Earth, the Moon, and other planets) and their movements (the Earth and other planets revolve around the Sun, the Moon revolves around the Earth)
- v) Understanding how day and night result from the Earth's rotation on its axis and how the Earth's rotation results in changing shadows throughout the day
- w) Understanding how seasons are related to the Earth's annual movement around the Sun

4. Revised Items

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|--|----------------------------|-------------------------------|
| Item # | Original Item | Item # | Revised Item |
| Q11 | | Q9 | <i>Note: Renumbered items</i> |
| Q13 | | Q11 | |
| Q14 | | Q12 | |
| Q15 | | Q13 | |
| Q16 | | Q14 | |
| Q17 | | Q15 | |
| Q19 | | Q16 | |
| Q20 | | Q17 | |
| Q21 | | Q18 | |
| Q22 | | Q19 | |
| Q23 | | Q20 | |
| Q24 | | Q21 | |
| Q25 | | Q24 | |
| Q26 | | Q25 | |
| Q28 | | Q26 | |
| Q30 | | Q27 | |
| Q31C | | Q28C | |
| Q32 | | Q29 | |
| Q34 | | Q31 | |
| Q7 | <p>How would you characterize each of the following within your school? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low • Very low <p>a) Teachers’ understanding of the school’s curricular goals b) Teachers’ degree of success in implementing the school’s curriculum c) Teachers’ expectations for student achievement d) Teachers’ ability to inspire students e) Teachers working together to improve student achievement f) Parental involvement in school activities g) Parental commitment to ensure that students are ready to learn h) Parental expectations for student achievement i) Parental support for student achievement j) Parental pressure for the school to</p> | Q7 | |

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|--|----------------------------|--|
| Item # | Original Item | Item # | Revised Item |
| | <p>maintain high academic standards</p> <ul style="list-style-type: none"> k) Students' desire to do well in school l) Students' ability to reach school's academic goals m) Students' respect for classmates who excel academically n) Collaboration between school leadership (including master teachers) and teachers to plan instruction | | <ul style="list-style-type: none"> k) Students' respect for classmates who excel academically l) Collaboration between school leadership (including master teachers) and teachers to plan instruction |
| Q11 | <p>How often do you feel the following way about being a teacher? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very Often • Often • Sometimes • Never or almost never <ul style="list-style-type: none"> a) I am content with my profession as a teacher b) I am satisfied with being a teacher at this school c) I find my work full of meaning and purpose d) I am enthusiastic about my job e) My work inspires me f) I am proud of the work I do g) I am going to continue teaching for as long as I can | Q9 | <p><i>Note: Two answer dimensions removed</i></p> <p>How often do you feel the following way about being a teacher? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very Often • Often • Sometimes • Never or almost never <ul style="list-style-type: none"> a) I am content with my profession as a teacher b) I find my work full of meaning and purpose c) I am enthusiastic about my job d) My work inspires me e) I am proud of the work I do |
| Q16 | <p>In your view, to what extent do the following limit how you teach this class? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Not at all • Some • A lot <ul style="list-style-type: none"> a) Students lacking prerequisite knowledge or skills b) Students suffering from lack of basic nutrition c) Students suffering from not enough sleep d) Disruptive students e) Uninterested students f) Students with physical disabilities g) Students with mental, emotional, or psychological disabilities | Q14 | <p><i>Note: Two dimensions added, one removed, and two reworded.</i></p> <p>In your view, to what extent do the following limit how you teach this class? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Not at all • Some • A lot <ul style="list-style-type: none"> a) Students lacking prerequisite knowledge or skills b) Students suffering from lack of basic nutrition c) Students suffering from not enough sleep d) Students absent from class e) Disruptive students f) Uninterested students g) Students with mental, emotional, or psychological impairment h) Students with difficulties understanding the language of instruction |
| Q19 | | Q16 | |

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|---|----------------------------|--|
| Item # | Original Item | Item # | Revised Item |
| | <p>In teaching mathematics to this class, how often do you ask students to do the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every lesson • About half the lessons • Some lessons • Never <ol style="list-style-type: none"> a) Listen to me explain new mathematics content b) Listen to me explain how to solve problems c) Memorize rules, procedures, and facts d) Work problems (individually or with peers) with my guidance e) Work problems together in the whole class with direct guidance from me f) Work problems (individually or with peers) while I am occupied by other tasks g) Take a written test or quiz h) Work in mixed ability groups i) Work in same ability groups | | <p><i>Note: One answer dimension removed and one added</i></p> <p>In teaching mathematics to this class, how often do you ask students to do the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every lesson • About half the lessons • Some lessons • Never <ol style="list-style-type: none"> a) Listen to me explain new mathematics content b) Listen to me explain how to solve problems c) Memorize rules, procedures, and facts d) Work problems (individually or with peers) with my guidance e) Work problems together in the whole class with direct guidance from me f) Work problems (individually or with peers) while I am occupied by other tasks g) Work on problems for which there is no immediately obvious method of solution h) Work in mixed ability groups i) Work in same ability groups |
| Q21C | <p>If Yes, How often do you have the students do the following activities on computers during mathematics lessons? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every day • Once or twice a week • Once or twice a month • Never or almost never <ol style="list-style-type: none"> a) Explore mathematics principles and concepts b) Practice skills and procedures c) Look up ideas and information | Q18C | <p><i>Note: Reworded stem, removed one answer dimension, and added two new dimensions.</i></p> <p>How often do you have the students do the following activities on computers during mathematics lessons? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every day • Once or twice a week • Once or twice a month • Never or almost never <ol style="list-style-type: none"> a) Practice skills and procedures b) Look up ideas and information c) Create data displays (e.g., charts, graphs) d) Watch videos to learn how to solve problems |
| Q22 | <p>The following list includes the main topics addressed by the TIMSS mathematics test.</p> | Q19 | <p><i>Note: Answer dimensions and dimensions sections added, removed, and reworded.</i></p> <p>The following list includes the main topics addressed by the TIMSS mathematics test.</p> |

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
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| Item # | Original Item | Item # | Revised Item |
| | <p>Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose “Mostly taught before this year.” If a topic was taught half this year but not yet completed, please choose “Mostly taught this year.” If a topic is not in the curriculum, please choose “Not yet taught or just introduced.”</p> <p><i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Mostly taught before this year • Mostly taught this year • Not yet taught or just introduced <p style="padding-left: 40px;">Number</p> <ul style="list-style-type: none"> a) Concepts of whole numbers, including place value and ordering b) Adding, subtracting, multiplying, and/or dividing with whole numbers c) Concepts of multiples and factors; odd and even numbers d) Concepts of fractions (fractions as parts of a whole or of a collection, or as a location on a number line) e) Adding and subtracting with fractions, comparing and ordering fractions f) Concepts of decimals, including place value and ordering, adding and subtracting with decimals g) Number sentences (finding the missing number, modeling simple situations with number sentences) h) Number patterns (extending number patterns and finding missing terms) <p style="padding-left: 40px;">Geometric Shapes and Measures</p> <ul style="list-style-type: none"> i) Lines: measuring, estimating length of; parallel and perpendicular lines j) Comparing and drawing angles k) Using informal coordinate systems to locate points in a plane (e.g., in square B4) l) Elementary properties of common geometric shapes m) Reflections and rotations n) Relationships between two-dimensional and three-dimensional shapes o) Finding and estimating areas, perimeters, and volumes <p style="padding-left: 40px;">Data Display</p> <ul style="list-style-type: none"> p) Reading and representing data from tables, pictographs, bar graphs, or pie | | <p>Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose “Mostly taught before this year.” If a topic was taught half this year but not yet completed, please choose “Mostly taught this year.” If a topic is not in the curriculum, please choose “Not yet taught or just introduced.”</p> <p><i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Mostly taught before this year • Mostly taught this year • Not yet taught or just introduced <p style="padding-left: 40px;">Number</p> <ul style="list-style-type: none"> a) Concepts of whole numbers, including place value and ordering b) Adding, subtracting, multiplying, and dividing with whole numbers c) Concepts of multiples and factors; odd and even numbers d) Number sentences (finding the missing number, representing problem situations with number sentences) e) Number patterns (extending number patterns and finding missing terms) f) Concepts of fractions, including representing, comparing and ordering, adding and subtracting simple fractions g) Concepts of decimals, including place value and ordering, adding and subtracting with decimals <p style="padding-left: 40px;">Measurement and Geometry</p> <ul style="list-style-type: none"> h) Solving problems involving length, including measuring and estimating i) Solving problems involving mass, volume, and time j) Finding and estimating perimeter, area, and volume k) Parallel and perpendicular lines l) Comparing and drawing angles m) Elementary properties of common geometric shapes n) Three-dimensional shapes, including relationships with their two-dimensional representations <p style="padding-left: 40px;">Data</p> <ul style="list-style-type: none"> o) Reading and interpreting data from tables, pictographs, bar graphs, line graphs, and pie charts p) Organizing and representing data to help answer questions |

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| Item # | Original Item | Item # | Revised Item |
| | <p>charts</p> <p>q) Drawing conclusions from data displays</p> | | <p>q) Drawing conclusions from data displays</p> |
| Q24 | <p>How much emphasis do you place on the following sources to monitor students' progress in mathematics? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Major emphasis • Some emphasis • Little or no emphasis <p>a) Assessment of students' ongoing work</p> <p>b) Classroom tests (for example, teacher-made or textbook tests)</p> <p>c) National or regional achievement tests</p> | Q21 | <p><i>Note: Item stem reworded, categories changed, and dimensions reworded, added, removed.</i></p> <p>How much importance do you place on the following assessment strategies in mathematics? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Major • Some • Little • None <p>a) Observing students as they work</p> <p>b) Asking students to answer questions during class</p> <p>c) Short, regular written assessments</p> <p>d) Longer tests (e.g., unit tests or exams)</p> <p>e) Long-term projects</p> |
| Q30 | <p>In teaching science to the students in this class, how often do you ask them to do the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every lesson • About half the lessons • Some lessons • Never <p>a) Listen to me explain new science content</p> <p>b) Observe natural phenomena such as the weather or a plant growing and describe what they see</p> <p>c) Watch me demonstrate an experiment or investigation</p> <p>d) Design or plan experiments or investigations</p> <p>e) Conduct experiments or investigations</p> <p>f) Present data from experiments or investigations</p> <p>g) Interpret data from experiments or investigations</p> <p>h) Use evidence from experiments or investigations to support conclusions</p> <p>i) Read their textbooks or other resource materials</p> <p>j) Have students memorize facts and principles</p> | Q27 | <p><i>Note: Removed one dimension</i></p> <p>In teaching science to the students in this class, how often do you ask them to do the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every lesson • About half the lessons • Some lessons • Never <p>a) Listen to me explain new science content</p> <p>b) Observe natural phenomena such as the weather or a plant growing and describe what they see</p> <p>c) Watch me demonstrate an experiment or investigation</p> <p>d) Design or plan experiments or investigations</p> <p>e) Conduct experiments or investigations</p> <p>f) Present data from experiments or investigations</p> <p>g) Interpret data from experiments or investigations</p> <p>h) Use evidence from experiments or investigations to support conclusions</p> <p>i) Read their textbooks or other resource materials</p> <p>j) Have students memorize facts and principles</p> <p>k) Do field work outside the class</p> |

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| Item # | Original Item | Item # | Revised Item |
| | k) Do field work outside the class l) Take a written test or quiz m) Work in mixed ability groups n) Work in same ability groups | | l) Work in mixed ability groups m) Work in same ability groups |
| Q31C | <p>If Yes, How often do you have the students do the following activities on computers during science lessons? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every day • Once or twice a week • Once or twice a month • Never or almost never <p>a) Practice skills and procedures b) Look up ideas and information c) Do scientific procedures or experiments d) Study natural phenomena through simulations</p> | Q28C | <p><i>Note: Modified stem wording and added one dimension</i></p> <p>How often do you have the students do the following activities on computers during science lessons? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every day • Once or twice a week • Once or twice a month • Never or almost never <p>a) Practice skills and procedures b) Look up ideas and information c) Do scientific procedures or experiments d) Study natural phenomena through simulations e) Prepare reports and presentations</p> |
| Q32 | <p>The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose “Mostly taught before this year.” If a topic was taught half this year but not yet completed, please choose “Mostly taught this year.” If a topic is not in the curriculum, please choose “Not yet taught or just introduced.” <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Mostly taught before this year • Mostly taught this year • Not yet taught or just introduced <p>Life Science</p> <p>a) Characteristics of living things and the major groups of living things (e.g., mammals, birds, insects, flowering plants) b) Major body structures and their functions in humans, other animals, and plants c) Life cycles of common plants and animals (e.g., humans, butterflies, frogs, flowering plants) d) Understanding that some</p> | Q29 | <p><i>Note: Several dimensions were added, removed, and reworded.</i></p> <p>The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose “Mostly taught before this year.” If a topic was taught half this year but not yet completed, please choose “Mostly taught this year.” If a topic is not in the curriculum, please choose “Not yet taught or just introduced.” <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Mostly taught before this year • Mostly taught this year • Not yet taught or just introduced <p>Life Science</p> <p>a) Physical and behavioral characteristics of living things and major groups of living things (e.g., mammals, birds, insects, flowering plants) b) Major body structures and their functions in humans, other animals, and plants c) Life cycles of common plants and animals (e.g., flowering plants, butterflies, frogs) d) Characteristics of plants and animals</p> |

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| Item # | Original Item | Item # | Revised Item |
| | <p>characteristics are inherited and some are the result of the environment</p> <p>e) How physical features and behaviors help living things survive in their environments</p> <p>f) Relationships in communities and ecosystems (e.g., simple food chains, predator-prey relationships, human impacts on the environment)</p> <p>g) Human health (transmission and prevention of diseases, symptoms of health and illness, importance of a healthy diet and exercise)</p> <p>Physical Science</p> <p>h) States of matter (solid, liquid, gas) and properties of the states of matter (volume, shape); how the state of matter changes by heating or cooling</p> <p>i) Classifying materials based on physical properties (e.g., weight/mass, volume, conducting heat, conducting electricity, magnetic attraction)</p> <p>j) Mixtures and how to separate a mixture into its components (e.g., sifting, filtering, evaporation, using a magnet)</p> <p>k) Chemical changes in everyday life (e.g., decaying, burning, rusting, cooking)</p> <p>l) Common sources of energy (e.g., the Sun, electricity, wind) and uses of energy (heating and cooling homes, providing light)</p> <p>m) Light and sound in everyday life (e.g., understanding shadows and reflection, understanding that vibrating objects make sound)</p> <p>n) Electricity and simple circuits (e.g., identifying materials that are conductors, recognizing that electricity can be changed to light or sound, knowing that a circuit must be complete to work correctly)</p> <p>o) Properties of magnets (e.g., knowing that like poles repel and opposite poles attract, recognizing that magnets can attract some objects)</p> <p>p) Forces that cause objects to move (e.g., gravity, pushing/pulling)</p> <p>Earth Science</p> <p>q) Common features of the Earth’s landscape (e.g., mountains, plains, deserts, rivers, oceans) and their relationship to human use (farming,</p> | | <p>that are inherited</p> <p>e) Interactions between organisms and their environments (e.g., physical features and behaviors that help living things survive in their environments)</p> <p>f) Relationships in ecosystems (e.g., simple food chains, predator-prey relationships, competition)</p> <p>g) Human health (transmission and prevention of diseases, everyday behaviors that promote good health)</p> <p>Physical Science</p> <p>h) States of matter (solid, liquid, gas) and their properties (volume, shape)</p> <p>i) Classifying materials based on physical properties (e.g., weight/mass, volume, state of matter, conductivity of heat or electricity)</p> <p>j) Mixtures, including methods for separating a mixture into its components (e.g., sifting, filtering, evaporation, using a magnet)</p> <p>k) Properties of magnets (e.g., like poles repel and opposite poles attract, magnets can attract some objects)</p> <p>l) Physical changes in everyday life (e.g., changes of state, dissolving)</p> <p>m) Chemical changes in everyday life (e.g., decaying, burning, rusting, cooking)</p> <p>n) Common sources of energy (e.g., the Sun, wind, oil) and uses of energy (heating and cooling homes, providing light)</p> <p>o) Light and sound in everyday life (e.g., shadows and reflections, vibrating objects make sound)</p> <p>p) Heat transfer (e.g., energy flows from a hot object to a colder object)</p> <p>q) Electricity and simple electrical circuits (e.g., a circuit must be complete to work correctly)</p> <p>r) Forces that cause objects to move (e.g., gravity, pushing/pulling) or change their motion (e.g., friction)</p> <p>s) Simple machines (e.g., levers, pulleys, wheels, ramps) that help make motion easier</p> <p>Earth Science</p> <p>t) Physical makeup of Earth’s surface (e.g., land and water in unequal proportions, sources of fresh and salt water)</p> <p>u) Earth’s resources used in everyday life (e.g., water, wind, soil, forests, oil,</p> |

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| Item # | Original Item | Item # | Revised Item |
| | <p>irrigation, land development)</p> <p>r) Where water is found on the Earth and how it moves in and out of the air (e.g., evaporation, rainfall, cloud formation, dew formation)</p> <p>s) Understanding that weather can change from day to day, from season to season, and by geographic location</p> <p>t) Understanding what fossils are and what they can tell us about past conditions on Earth</p> <p>u) Objects in the solar system (the Sun, the Earth, the Moon, and other planets) and their movements (the Earth and other planets revolve around the Sun, the Moon revolves around the Earth)</p> <p>v) Understanding how day and night result from the Earth’s rotation on its axis and how the Earth’s rotation results in changing shadows throughout the day</p> <p>w) Understanding how seasons are related to the Earth’s annual movement around the Sun</p> | | <p>natural gas, minerals)</p> <p>v) Changes in Earth’s surface over time (e.g., mountain building, weathering, erosion)</p> <p>w) Fossils and what they can tell us about past conditions on Earth</p> <p>x) Weather and climate (e.g., daily, seasonal, and locational variations versus long term trends)</p> <p>y) Objects in the Solar System (the Sun, the Earth, the Moon, and other planets) and their movements</p> <p>z) Earth’s motion and related patterns observed on Earth (e.g., day and night, seasons)</p> |
| Q34 | <p>How much emphasis do you place on the following sources to monitor students’ progress in science? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Major emphasis • Some emphasis • Little or no emphasis <p>a) Assessment of students’ ongoing work</p> <p>b) Classroom tests (for example, teacher-made or textbook tests)</p> <p>c) National or regional achievement tests</p> | Q31 | <p><i>Note: Item stem reworded, categories changed, and dimensions reworded, added, removed.</i></p> <p>How much importance do you place on the following assessment strategies in science? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Major • Some • Little • None <p>a) Observing students as they work</p> <p>b) Asking students to answer questions during class</p> <p>c) Short, regular written assessments</p> <p>d) Longer tests (e.g., unit tests or exams)</p> <p>e) Long-term projects</p> |

C. Student Questionnaire – Grade 4

1. New Adaptation of all items (not already included in the U.S. 2015 main study version)

| TIMSS 2019 U.S. Field Test (draft) | | |
|---|---|---------------------------|
| 2015 U.S. adaptation | 2019 Field Test U.S. adaptation | Item(s) |
| Your school has agreed to participate in TIMSS 2015 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide. | Your school has agreed to participate in TIMSS 2019 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide. | <i>Note: Year updated</i> |

3. Deleted Items (entire stem)

| Item Number | Deleted Text/Item |
|-------------|--|
| Q13 | <p>How often do you use a computer or tablet in each of these places for schoolwork (including classroom tasks, homework, studying outside of class)?</p> <p><i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every day or almost every day • Once or twice a week • Once or twice a month • Never or almost never <p>a) At home b) At school c) Some other place</p> |

4. Revised Items

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|---|---------------|---|--|
| Item # | Original Item | Item # | Revised Item |
| Q14 Q15 Q16 Q17 Q18 Q19 Q20 Q21 Q22 Q23 Q24 | | Q13 Q14 Q15 Q16 Q17 Q18 Q19 Q20 Q21 Q22 Q23 | <i>Note: Renumbered items</i> |
| Q5 | | Q5 | <i>Note: Some answer dimensions reworded and</i> |

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|---|----------------------------|--|
| Item # | Original Item | Item # | Revised Item |
| | <p>Do you have any of these things at your home? Fill in only one circle for each row.</p> <ul style="list-style-type: none"> • Yes • No <p>a) A computer or tablet of your own b) A computer or tablet that is shared with other people at home c) Study desk/table for your use d) Your own room e) Internet connection f) Your own mobile phone g) A gaming system (e.g., PlayStation, Wii, Xbox) h) VCR, DVD, or Blu-ray player</p> | | <p><i>one dimension added.</i></p> <p>Do you have any of these things at your home? Fill in only one circle for each row.</p> <ul style="list-style-type: none"> • Yes • No <p>a) A computer or tablet b) Study desk/table for your use c) Your own room d) Internet connection e) Your own mobile phone f) A gaming system (e.g., PlayStation, Wii, Xbox) g) VCR, DVD, or Blu-ray player</p> |
| Q6A Q6B | <p>Was your mother (or stepmother or female legal guardian) born in the United States? (“United States” includes the 50 states, its territories, the District of Columbia, and U.S. military bases abroad) Fill in one circle only.</p> <ul style="list-style-type: none"> • Yes • No • I don't know <p>Was your father (or stepfather or male legal guardian) born in the United States? Fill in one circle only.</p> <ul style="list-style-type: none"> • Yes • No • I don't know | Q6 Q6A Q6B | <p><i>Note: Item stem and dimensions reworded and combined into one question with parts A and B.</i></p> <p>The following question is about your Parent/Guardian A and Parent/Guardian B. If you have only one parent/guardian, answer for Parent/Guardian A. If you have two parents/guardians, choose one for Parent/Guardian A and the other for Parent/Guardian B. Fill in one circle only.</p> <ul style="list-style-type: none"> • Yes • No • I don't know • Not applicable <p>a) Parent/Guardian A b) Parent/Guardian B</p> |
| Q11A | <p>About how often are you absent from school? Fill in one circle only.</p> <ul style="list-style-type: none"> • Once a week or more • Once every two weeks • Once a month • Never or almost never | Q11A | <p><i>Note: One answer dimension added.</i></p> <p>About how often are you absent from school? Fill in one circle only.</p> <ul style="list-style-type: none"> • Once a week • Once every two weeks • Once a month • Once every two months • Never or almost never |
| Q12 | <p>How often do you eat breakfast on school days? Fill in one circle only.</p> | Q12 | <p><i>Note: Item stem reworded and answer dimensions added.</i></p> <p>How often do you feel this way when you arrive at school? Fill in one circle only.</p> |

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| Item # | Original Item | Item # | Revised Item |
| | <ul style="list-style-type: none"> • Every day • Most days • Sometimes • Never or almost never | | <ul style="list-style-type: none"> • Every day • Almost every day • Sometimes • Never <p>a) I feel tired b) I feel hungry</p> |
| Q14 | <p>What do you think about your school? Tell how much you agree with these statements. <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little • Disagree a lot <p>a) I like being in school b) I feel safe when I am at school c) I feel like I belong at this school d) I like to see my classmates at school e) Teachers at my school are fair to me f) I am proud to go to this school g) I learn a lot in school</p> | Q13 | <p><i>Note: Two answer dimensions added</i></p> <p>What do you think about your school? Tell how much you agree with these statements. <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little • Disagree a lot <p>a) I like being in school b) I feel safe when I am at school c) I feel like I belong at this school d) Teachers at my school are fair to me e) I am proud to go to this school</p> |
| Q15 | <p>During this school year, how often have other students from your school done any of the following things to you (including through texting or the Internet)? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • At least once a week • Once or twice a month • A few times a year • Never <p>a) Made fun of me or called me names b) Left me out of their games or activities c) Spread lies about me d) Stole something from me e) Hit or hurt me (e.g., shoving, hitting, kicking) f) Made me do things I didn't want to do g) Shared embarrassing information about me h) Threatened me</p> | Q14 | <p><i>Note: Added one dimension</i></p> <p>During this school year, how often have other students from your school done any of the following things to you (including through texting or the Internet)? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • At least once a week • Once or twice a month • A few times a year • Never <p>a) Made fun of me or called me names b) Left me out of their games or activities c) Spread lies about me d) Stole something from me e) Damaged something of mine on purpose f) Hit or hurt me (e.g., shoving, hitting, kicking) g) Made me do things I didn't want to do h) Shared embarrassing information about me i) Threatened me</p> |
| Q17 | <p>How much do you agree with these statements about your mathematics lessons? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little | Q16 | <p><i>Note: Deleted one dimension and added three.</i></p> <p>How much do you agree with these statements about your mathematics lessons? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little |

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|----------------------------|---|----------------------------|---|
| Item # | Original Item | Item # | Revised Item |
| | <ul style="list-style-type: none"> • Disagree a lot a) I know what my teacher expects me to do b) My teacher is easy to understand c) I am interested in what my teacher says d) My teacher gives me interesting things to do e) My teacher has clear answers to my questions f) My teacher is good at explaining mathematics g) My teacher lets me show what I have learned h) My teacher does a variety of things to help us learn i) My teacher tells me how to do better when I make a mistake j) My teacher listens to what I have to say | | <ul style="list-style-type: none"> • Disagree a lot a) I know what my teacher expects me to do b) My teacher is easy to understand c) My teacher gives me interesting things to do d) My teacher has clear answers to my questions e) My teacher is good at explaining mathematics f) My teacher lets me show what I have learned g) My teacher does a variety of things to help us learn h) My teacher tells me how to do better when I make a mistake i) My teacher listens to what I have to say j) My teacher explains a topic again when we don't understand k) My teacher lets me explain why my answer is correct l) My teacher asks me to work on mathematics problems on my own |
| Q20 | <p>How much do you agree with these statements about your science lessons? Fill in only one circle for each row.</p> <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little • Disagree a lot <ul style="list-style-type: none"> a) I know what my teacher expects me to do b) My teacher is easy to understand c) I am interested in what my teacher says d) My teacher gives me interesting things to do e) My teacher has clear answers to my questions f) My teacher is good at explaining science g) My teacher lets me show what I have learned h) My teacher does a variety of things to help us learn i) My teacher tells me how to do better when I make a mistake j) My teacher listens to what I have to say | Q19 | <p><i>Note: Deleted one dimension and added three.</i></p> <p>How much do you agree with these statements about your science lessons? Fill in only one circle for each row.</p> <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little • Disagree a lot <ul style="list-style-type: none"> a) I know what my teacher expects me to do b) My teacher is easy to understand c) My teacher gives me interesting things to do d) My teacher has clear answers to my questions e) My teacher is good at explaining science f) My teacher lets me show what I have learned g) My teacher does a variety of things to help us learn h) My teacher tells me how to do better when I make a mistake i) My teacher listens to what I have to say j) My teacher explains a topic again when we don't understand k) My teacher lets me explain why my answer is correct |

APPENDIX C.1: SUMMARY OF U.S. CHANGES TO TIMSS INSTRUMENTS

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|---------------|----------------------------|---|
| Item # | Original Item | Item # | Revised Item |
| | | | l) My teacher helps me learn science facts m) My teacher helps me do science experiments |

D. Principal Questionnaire – Grade 8

1. New Adaptations of all items (not already included in the U.S. 2015 main study version)

| TIMSS 2019 U.S. Field Test (draft) | | |
|--|--|-----------------------------------|
| 2015 U.S. adaptation | 2019 Field Test U.S. adaptation | Item(s) |
| <p>Your school has agreed to participate in TIMSS 2015 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide.</p> | <p>Your school has agreed to participate in TIMSS 2019 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide.</p> | <p><i>Note: Year updated</i></p> |
| <p>Q1</p> <p>What is the total enrollment of students in your school as of March 1, 2015?</p> <p>_____ students</p> <p><i>Write in the number.</i></p> | <p>Q1</p> <p>What is the total enrollment of students in your school as of March 1, 2018?</p> <p>_____ students</p> <p><i>Write in the number.</i></p> | <p><i>Note: Updated date.</i></p> |
| <p>Q2</p> <p>What is the total enrollment of eighth-grade students in your school as of March 1, 2015?</p> <p>_____ students</p> <p><i>Write in the number.</i></p> | <p>Q2</p> <p>What is the total enrollment of eighth-grade students in your school as of March 1, 2018?</p> <p>_____ students</p> <p><i>Write in the number.</i></p> | <p><i>Note: Updated date.</i></p> |
| <p>Q4</p> <p>Around the 1st of October 2014, what percentage of students at this school were eligible to receive free or reduced-price lunches through the National School Lunch Program?</p> <p>_____ percentage of students</p> <p><i>Write in the number.</i></p> | <p>Q4</p> <p>Around the 1st of October 2017, what percentage of students at this school were eligible to receive free or reduced-price lunches through the National School Lunch Program?</p> <p>_____ percentage of students</p> <p><i>Write in the number.</i></p> | <p><i>Note: Updated date</i></p> |

2. New Items

| Item # | Added Text/Item |
|--------|---|
| Q14 | <p>Does your school provide students access to digital learning resources (e.g., books, videos)?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Yes • No |
| Q17 | <p>How much do you agree with these statements about mathematics and science education within your school?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little • Disagree a lot <ol style="list-style-type: none"> a) The school provides students with information about career options in mathematics and science b) The school has initiatives to promote student interest in mathematics and science (e.g., student clubs, competitions) c) The school promotes professional development for teachers of mathematics and science d) The school provides extra lessons to help students excel in mathematics and science e) The school provides special activities in mathematics and science for interested students f) The school has a specific goal to improve mathematics and science education g) The school encourages students to continue studying mathematics and science in the future h) Mathematics and science teachers in this school spend extra time working with students interested in mathematics and science |

3. Deleted Items (entire stem)

| Item Number | Deleted Item |
|-------------|---|
| Q10 | <p>Does your school provide free meals for students?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Yes, for all students • Yes, for some students • No <ol style="list-style-type: none"> a) Breakfast b) Lunch |
| Q12A | <p>Does your school provide a place where students can work on their schoolwork before or after school?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Yes • No • (If No, go to #13) |
| Q12B | <p>If Yes,</p> <p>Is someone available to assist them with their schoolwork?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Yes • No |

| Item Number | Deleted Item |
|-------------|--|
| Q22 | <p>How difficult was it to fill eighth grade teaching vacancies for this school year for the following subjects? <i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Were no vacancies in this subject • Easy to fill vacancies • Somewhat difficult • Very difficult <p style="margin-left: 40px;">a) Mathematics b) Science c) Other</p> |
| Q23 | <p>Does your school currently use any incentives (e.g., pay, housing, signing bonus, smaller classes) to recruit or retain eighth-grade teachers in the following fields? <i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Yes • No <p style="margin-left: 40px;">a) Mathematics b) Science c) Other</p> |

4. Revised Items

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|--|--|--|---|
| Item # | Item | Item # | Revised Item |
| Q11 Q14 Q15 Q16 Q17 Q18 Q19 Q24 Q25 Q26 Q27 Q28 | | Q10 Q11 Q12 Q13 Q15 Q16 Q18 Q19 Q22 Q23 Q24 Q25 | <i>Note: Renumbered items</i> |
| Q13A Q13B | <p>If Yes, <u>Approximately</u> how many books (print and digital) with different titles does your school library have (exclude magazines and periodicals)? <i>Fill in one circle for each column.</i></p> <p style="margin-left: 40px;">c) Print</p> <ul style="list-style-type: none"> • 250 or fewer • 251–500 • 501–2,000 • 2,001–5,000 • 5,001–10,000 • More than 10,000 <p style="margin-left: 40px;">d) Digital</p> <ul style="list-style-type: none"> • 0 • 1–5 • 6–10 • 11–30 • 31 or more | Q13A Q13B | <p><i>Note: Question stem structure removed part of the question.</i></p> <p>If Yes, <u>Approximately</u> how many books (print) with different titles does your school library have (exclude magazines and periodicals)? <i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • 250 or fewer • 251–500 • 501–2,000 • 2,001–5,000 • 5,001–10,000 • More than 10,000 <p><u>Approximately</u> how many titles of magazines and other periodicals (print) does your school library have?</p> |

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|----------------------------|---|----------------------------|--|
| Item # | Item | Item # | Revised Item |
| | | | <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • 0 • 1–5 • 6–10 • 11–30 • 31 or more |
| Q18 | <p>How would you characterize each of the following within your school?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low • Very low <ol style="list-style-type: none"> a) Teachers’ understanding of the school’s curricular goals b) Teachers’ degree of success in implementing the school’s curriculum c) Teachers’ expectations for student achievement d) Teachers working together to improve student achievement e) Teachers’ ability to inspire students f) Parental involvement in school activities g) Parental commitment to ensure that students are ready to learn h) Parental expectations for student achievement i) Parental support for student achievement j) Parental pressure for the school to maintain high academic standards k) Students’ desire to do well in school l) Students’ ability to reach school’s academic goals m) Students’ respect for classmates who excel in school | Q16 | <p><i>Note: Two dimensions removed</i></p> <p>How would you characterize each of the following within your school?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low • Very low <ol style="list-style-type: none"> a) Teachers’ understanding of the school’s curricular goals b) Teachers’ degree of success in implementing the school’s curriculum c) Teachers’ expectations for student achievement d) Teachers’ ability to inspire students e) Parental involvement in school activities f) Parental commitment to ensure that students are ready to learn g) Parental expectations for student achievement h) Parental support for student achievement i) Students’ desire to do well in school j) Students’ ability to reach school’s academic goals k) Students’ respect for classmates who excel in school |
| Q28 | <p>Do you hold the following qualifications or credentials in educational leadership?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Yes • No <ol style="list-style-type: none"> a) Master's degree or professional degree (MD, DDS, lawyer, minister) b) Doctorate (Ph.D. or Ed.D.) | Q25 | <p><i>Note: One dimension added</i></p> <p>Do you hold the following qualifications or credentials in educational leadership?</p> <p><i>Fill in one circle for each row.</i></p> <ul style="list-style-type: none"> • Yes • No <ol style="list-style-type: none"> a) Principal Certification b) Master's degree or professional degree (MD, DDS, lawyer, minister) c) Doctorate (Ph.D. or Ed.D.) |

E. Teacher Math Questionnaire – Grade 8

1. New Adaptations of all items (not already included in the U.S. 2015 main study version)

| TIMSS 2019 U.S. Field Test (draft) | | |
|---|---|---------------------------|
| 2015 U.S. adaptation | 2019 Field Test U.S. adaptation | Item(s) |
| Your school has agreed to participate in TIMSS 2015 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide. | Your school has agreed to participate in TIMSS 2019 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide. | <i>Note: Year updated</i> |

2. New Items

| Item # | Added Text/Item |
|--------|---|
| Q23 | <p>About how often do eighth-grade students in this class take mathematics tests on computers or tablets?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • More than once a month • Once a month • Twice a year • Once a year or less • Never |
| Q24 | <p>To what extent do you depend on assessment results?</p> <p><i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • A lot • Some • A little • None <p>a) To modify your instruction b) To give grades c) To report to parents d) To determine the learning needs of each student</p> |

3. Deleted Items (entire stem)

| Item # | Deleted Text/Item |
|--------|--|
| Q9 | <p>In your current school, how severe is each problem?</p> <p><i>Fill in only one circle for each row.</i></p> |

| | |
|--------------------|---|
| | <ul style="list-style-type: none"> • Not a problem • Minor problem • Moderate problem • Serious problem <p>a) The school building needs significant repair b) Teachers do not have adequate workspace (e.g., for preparation, collaboration, or meeting with students) c) Teachers do not have adequate instructional materials and supplies d) The school classrooms are not cleaned often enough e) The school classrooms need maintenance work f) Teachers do not have adequate technological resources g) Teachers do not have adequate support for using technology</p> |
| <p>Q10</p> | <p>How often do you have the following types of interactions with other teachers? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very Often • Often • Sometimes • Never or almost never <p>a) Discuss how to teach a particular topic b) Collaborate in planning and preparing instructional materials c) Share what I have learned about my teaching experiences d) Visit another classroom to learn more about teaching e) Work together to try out new ideas f) Work as a group on implementing the curriculum g) Work with teachers from other grades to ensure continuity in learning</p> |
| <p>Q18</p> | <p>In teaching mathematics to this class, how would you characterize your confidence in doing the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low <p>a) Inspiring students to learn mathematics b) Showing students a variety of problem solving strategies c) Providing challenging tasks for the highest achieving students d) Adapting my teaching to engage students' interest e) Helping students appreciate the value of learning mathematics f) Assessing student comprehension of mathematics g) Improving the understanding of struggling students h) Making mathematics relevant to students i) Developing students' higher-order thinking skills</p> |
| <p>Q21B</p> | <p>If Yes, How often do students in this class use calculators in their mathematics lessons for the following activities? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every lesson • About half the lessons • Some lessons • Never <p>a) Check answers b) Do routine computations c) Solve complex problems d) Explore number concepts</p> |

| | |
|-----|--|
| Q28 | <p>How well prepared do you feel you are to teach the following mathematics topics? If a topic is not in the eighth-grade curriculum or you are not responsible for teaching this topic, please choose “Not applicable.” <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Not applicable • Very well prepared • Somewhat prepared • Not well prepared <p style="text-align: center;">Number</p> <ul style="list-style-type: none"> a) Computing with whole numbers b) Comparing and ordering rational numbers c) Computing with rational numbers (fractions, decimals, and integers) d) Concepts of irrational numbers e) Problem solving involving percents or proportions <p style="text-align: center;">Algebra</p> <ul style="list-style-type: none"> f) Simplifying and evaluating algebraic expressions g) Simple linear equations and inequalities h) Simultaneous (two variables) equations i) Numeric, algebraic, and geometric patterns or sequences (extension, missing terms, generalization of patterns) j) Representation of functions as ordered pairs, tables, graphs, words, or equations k) Properties of functions (slopes, intercepts, etc.) <p style="text-align: center;">Geometry</p> <ul style="list-style-type: none"> l) Geometric properties of angles and geometric shapes (triangles, quadrilaterals, and other common polygons) m) Congruent figures and similar triangles n) Relationship between three-dimensional shapes and their two-dimensional representations o) Using appropriate measurement formulas for perimeters, circumferences, areas, surface areas, and volumes p) Points on the Cartesian plane q) Translation, reflection, and rotation <p style="text-align: center;">Data and Chance</p> <ul style="list-style-type: none"> r) Characteristics of data sets (mean, median, mode, and shape of distributions) s) Interpreting data sets (e.g., draw conclusions, make predictions, and estimate values between and beyond given data points) t) Judging, predicting, and determining the chances of possible outcomes |
|-----|--|

4. Revised Items

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|---------------|----------------------------|-------------------------------|
| Item # | Original Item | Item # | Revised Item |
| Q11 | | Q9 | <i>Note: Renumbered items</i> |
| Q12 | | Q10 | |
| Q13 | | Q11 | |
| Q14 | | Q12 | |
| Q15 | | Q13 | |
| Q16 | | Q14 | |
| Q17 | | Q15 | |
| Q19 | | Q16 | |
| Q20 | | Q17 | |
| Q21 | | Q18 | |

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|--|--|--|--|
| Item # | Original Item | Item # | Revised Item |
| Q22 Q23 Q24 Q25 Q26 Q27 | | Q19 Q20 Q21 Q22 Q25 Q26 | |
| Q7 | <p>How would you characterize each of the following within your school? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low • Very low <p>a) Teachers’ understanding of the school’s curricular goals b) Teachers’ degree of success in implementing the school’s curriculum c) Teachers’ expectations for student achievement d) Teachers’ ability to inspire students e) Teachers working together to improve student achievement f) Parental involvement in school activities g) Parental commitment to ensure that students are ready to learn h) Parental expectations for student achievement i) Parental support for student achievement j) Parental pressure for the school to maintain high academic standards k) Students’ desire to do well in school l) Students’ ability to reach school’s academic goals m) Students’ respect for classmates who excel academically n) Clarity of the school’s educational objectives o) Collaboration between school leadership and teachers to plan instruction p) Amount of instructional support provided to teachers by school leadership q) School leadership’s support for teachers’ professional development</p> | Q7 | <p><i>Note: Five answer dimensions removed</i></p> <p>How would you characterize each of the following within your school? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low • Very low <p>a) Teachers’ understanding of the school’s curricular goals b) Teachers’ degree of success in implementing the school’s curriculum c) Teachers’ expectations for student achievement d) Teachers’ ability to inspire students e) Parental involvement in school activities f) Parental commitment to ensure that students are ready to learn g) Parental expectations for student achievement h) Parental support for student achievement i) Students’ desire to do well in school j) Students’ ability to reach school’s academic goals k) Students’ respect for classmates who excel academically l) Collaboration between school leadership (including master teachers) and teachers to plan instruction</p> |
| Q11 | How often do you feel the following way | Q9 | <p><i>Note: Two answer dimensions removed</i></p> <p>How often do you feel the following way</p> |

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| Item # | Original Item | Item # | Revised Item |
| | <p>about being a teacher? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very Often • Often • Sometimes • Never or almost never <p>a) I am content with my profession as a teacher b) I am satisfied with being a teacher at this school c) I find my work full of meaning and purpose d) I am enthusiastic about my job e) My work inspires me f) I am proud of the work I do g) I am going to continue teaching for as long as I can</p> | | <p>about being a teacher? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very Often • Often • Sometimes • Never or almost never <p>a) I am content with my profession as a teacher b) I find my work full of meaning and purpose c) I am enthusiastic about my job d) My work inspires me e) I am proud of the work I do</p> |
| Q16 | <p>In your view, to what extent do the following limit how you teach this class? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Not at all • Some • A lot <p>a) Students lacking prerequisite knowledge or skills b) Students suffering from lack of basic nutrition c) Students suffering from not enough sleep d) Disruptive students e) Uninterested students f) Students with physical disabilities g) Students with mental, emotional, or psychological disabilities</p> | Q14 | <p><i>Note: Two dimensions added, one removed, and two reworded.</i></p> <p>In your view, to what extent do the following limit how you teach this class? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Not at all • Some • A lot <p>a) Students lacking prerequisite knowledge or skills b) Students suffering from lack of basic nutrition c) Students suffering from not enough sleep d) Students absent from class e) Disruptive students f) Uninterested students g) Students with mental, emotional, or psychological impairment h) Students with difficulties understanding the language of instruction</p> |
| Q19 | <p>In teaching mathematics to this class, how often do you ask students to do the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every lesson • About half the lessons • Some lessons • Never | Q16 | <p><i>Note: One answer dimension removed and one added</i></p> <p>In teaching mathematics to this class, how often do you ask students to do the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every lesson • About half the lessons • Some lessons • Never |

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|----------------------------|--|----------------------------|---|
| Item # | Original Item | Item # | Revised Item |
| | <p>a) Listen to me explain new mathematics content</p> <p>b) Listen to me explain how to solve problems</p> <p>c) Memorize rules, procedures, and facts</p> <p>d) Work problems (individually or with peers) with my guidance</p> <p>e) Work problems together in the whole class with direct guidance from me</p> <p>f) Work problems (individually or with peers) while I am occupied by other tasks</p> <p>g) Take a written test or quiz</p> <p>h) Work in mixed ability groups</p> <p>i) Work in same ability groups</p> | | <p>a) Listen to me explain new mathematics content</p> <p>b) Listen to me explain how to solve problems</p> <p>c) Memorize rules, procedures, and facts</p> <p>d) Work problems (individually or with peers) with my guidance</p> <p>e) Work problems together in the whole class with direct guidance from me</p> <p>f) Work problems (individually or with peers) while I am occupied by other tasks</p> <p>g) Work on problems for which there is no immediately obvious method of solution</p> <p>h) Work in mixed ability groups</p> <p>i) Work in same ability groups</p> |
| Q22C | <p>If Yes, How often do you have the students do the following activities on computers during mathematics lessons? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every day • Once or twice a week • Once or twice a month • Never or almost never <p>a) Explore mathematics principles and concepts</p> <p>b) Practice skills and procedures</p> <p>c) Look up ideas and information</p> | Q19C | <p><i>Note: Reworded stem, removed one answer dimension, and added two new dimensions.</i></p> <p>How often do you have the students do the following activities on computers during mathematics lessons? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every day • Once or twice a week • Once or twice a month • Never or almost never <p>a) Practice skills and procedures</p> <p>b) Look up ideas and information</p> <p>c) Process and analyze data</p> <p>d) Create data displays (e.g., charts, graphs)</p> <p>e) Create spreadsheets</p> <p>f) Watch videos to learn how to solve problems</p> |
| Q23 | <p>The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the eighth grade, please choose “Mostly taught before this year.” If a topic was taught half this year but not yet completed, please choose “Mostly taught this year.” If a topic is not in the curriculum, please choose “Not yet taught or just introduced.” <i>Fill in only one circle for each row.</i></p> | Q20 | <p><i>Note: Added two dimensions.</i></p> <p>The following list includes the main topics addressed by the TIMSS mathematics test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the eighth grade, please choose “Mostly taught before this year.” If a topic was taught half this year but not yet completed, please choose “Mostly taught this year.” If a topic is not in the curriculum, please choose “Not yet taught or just introduced.” <i>Fill in only one circle for each row.</i></p> |

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|----------------------------|---|----------------------------|---|
| Item # | Original Item | Item # | Revised Item |
| | <ul style="list-style-type: none"> • Mostly taught before this year • Mostly taught this year • Not yet taught or just introduced <p style="text-align: center;">Number</p> <ul style="list-style-type: none"> a) Computing with whole numbers b) Comparing and ordering rational numbers c) Computing with rational numbers (fractions, decimals, and integers) d) Concepts of irrational numbers e) Problem solving involving percents or proportions <p style="text-align: center;">Algebra</p> <ul style="list-style-type: none"> f) Simplifying and evaluating algebraic expressions g) Simple linear equations and inequalities h) Simultaneous (two variables) equations i) Numeric, algebraic, and geometric patterns or sequences (extension, missing terms, generalization of patterns) j) Representation of functions as ordered pairs, tables, graphs, words, or equations k) Properties of functions (slopes, intercepts, etc.) <p style="text-align: center;">Geometry</p> <ul style="list-style-type: none"> l) Geometric properties of angles and geometric shapes (triangles, quadrilaterals, and other common polygons) m) Congruent figures and similar triangles n) Relationship between three-dimensional shapes and their two-dimensional representations o) Using appropriate measurement formulas for perimeters, circumferences, areas, surface areas, and volumes p) Points on the Cartesian plane q) Translation, reflection, and rotation <p style="text-align: center;">Data and Chance</p> <ul style="list-style-type: none"> r) Characteristics of data sets (mean, median, mode, and shape of distributions) s) Interpreting data sets (e.g., draw conclusions, make predictions, and estimate values between and beyond given data points) t) Judging, predicting, and determining | | <ul style="list-style-type: none"> • Mostly taught before this year • Mostly taught this year • Not yet taught or just introduced <p style="text-align: center;">Number</p> <ul style="list-style-type: none"> a) Computing with whole numbers b) Comparing and ordering rational numbers c) Computing with rational numbers (fractions, decimals, and integers) d) Concepts of irrational numbers e) Problem solving involving percents or proportions <p style="text-align: center;">Algebra</p> <ul style="list-style-type: none"> f) Simplifying and evaluating algebraic expressions g) Simple linear equations and inequalities h) Simultaneous (two variables) equations i) Numeric, algebraic, and geometric patterns or sequences (extension, missing terms, generalization of patterns) j) Representation of functions as ordered pairs, tables, graphs, words, or equations k) Properties of functions (slopes, intercepts, etc.) <p style="text-align: center;">Geometry</p> <ul style="list-style-type: none"> l) Geometric properties of angles and geometric shapes (triangles, quadrilaterals, and other common polygons) m) Congruent figures and similar triangles n) Relationship between three-dimensional shapes and their two-dimensional representations o) Using appropriate measurement formulas for perimeters, circumferences, areas, surface areas, and volumes p) Points on the Cartesian plane q) Translation, reflection, and rotation <p style="text-align: center;">Data and Chance</p> <ul style="list-style-type: none"> r) Characteristics of data sets (mean, median, mode, and shape of distributions) s) Interpreting data sets (e.g., draw conclusions, make predictions, and estimate values between and beyond given data points) t) Judging, predicting, and determining |

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| Item # | Original Item | Item # | Revised Item |
| | the chances of possible outcomes | | the chances of possible outcomes u) Theoretical and empirical probability of simple events v) Theoretical and empirical probability of compound events |
| Q25 | <p>How much emphasis do you place on the following sources to monitor students' progress in mathematics? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Major emphasis • Some emphasis • Little or no emphasis <p>a) Assessment of students' ongoing work b) Classroom tests (for example, teacher-made or textbook tests) c) National or regional achievement tests</p> | Q22 | <p><i>Note: Item stem reworded, categories changed, and dimensions reworded, added, removed.</i></p> <p>How much importance do you place on the following assessment strategies in mathematics? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Major • Some • Little • None <p>a) Observing students as they work b) Asking students to answer questions during class c) Short, regular written assessments d) Longer tests (e.g., unit tests or exams) e) Long-term projects</p> |

F. Teacher Science Questionnaire – Grade 8

1. New Adaptations of all items (not already included in the U.S. 2015 main study version)

| TIMSS 2019 U.S. Field Test (draft) | | |
|---|---|---------------------------|
| 2015 U.S. adaptation | 2019 Field Test U.S. adaptation | Item(s) |
| Your school has agreed to participate in TIMSS 2015 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide. | Your school has agreed to participate in TIMSS 2019 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide. | <i>Note: Year updated</i> |

2. New Items

| Item # | Added Text/Item |
|--------|---|
| Q22 | <p>About how often do eighth-grade students in this class take science tests on computers or tablets?</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • More than once a month • Once a month • Twice a year • Once a year or less • Never |
| Q23 | <p>To what extent do you depend on assessment results?</p> <p><i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • A lot • Some • A little • None <p>a) To modify your instruction b) To give grades c) To report to parents d) To determine the learning needs of each student</p> |

3. Deleted Items (entire stem)

| Item # | Deleted Text/Item |
|--------|--|
| Q9 | <p>In your current school, how severe is each problem?</p> <p><i>Fill in only one circle for each row.</i></p> |

| | |
|-------------------|--|
| | <ul style="list-style-type: none"> • Not a problem • Minor problem • Moderate problem • Serious problem <p>a) The school building needs significant repair b) Teachers do not have adequate workspace (e.g., for preparation, collaboration, or meeting with students) c) Teachers do not have adequate instructional materials and supplies d) The school classrooms are not cleaned often enough e) The school classrooms need maintenance work f) Teachers do not have adequate technological resources g) Teachers do not have adequate support for using technology</p> |
| <p>Q10</p> | <p>How often do you have the following types of interactions with other teachers? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very Often • Often • Sometimes • Never or almost never <p>a) Discuss how to teach a particular topic b) Collaborate in planning and preparing instructional materials c) Share what I have learned about my teaching experiences d) Visit another classroom to learn more about teaching e) Work together to try out new ideas f) Work as a group on implementing the curriculum g) Work with teachers from other grades to ensure continuity in learning</p> |
| <p>Q18</p> | <p>In teaching science to this class, how would you characterize your confidence in doing the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low <p>a) Inspiring students to learn science b) Explaining science concepts or principles by doing science experiments c) Providing challenging tasks for the highest achieving students d) Adapting my teaching to engage students' interest e) Helping students appreciate the value of learning science f) Assessing student comprehension of science g) Improving the understanding of struggling students h) Making science relevant to students i) Developing students' higher-order thinking skills j) Teaching science using inquiry methods</p> |
| <p>Q27</p> | <p>How well prepared do you feel you are to teach the following science topics? If a topic is not in the fourth-grade curriculum or you are not responsible for teaching this topic, please choose "Not applicable." <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Not applicable • Very well prepared • Somewhat prepared • Not well prepared <p>Biology</p> <p>a) Differences among major taxonomic groups of organisms (plants, animals, fungi, mammals, birds, reptiles, fish, amphibians) b) Major organs and organ systems in humans and other organisms (structure/function, life processes that maintain stable bodily conditions)</p> |

| | |
|--|--|
| | <ul style="list-style-type: none"> c) Cells, their structure and functions, including respiration and photosynthesis as cellular processes d) Life cycles, sexual reproduction, and heredity (passing on of traits, inherited versus acquired/learned characteristics) e) Role of variation and adaptation in survival/extinction of species in a changing environment (including fossil evidence for changes in life on Earth over time) f) Interdependence of populations of organisms in an ecosystem (e.g., energy flow, food webs, competition, predation) and factors affecting population size in an ecosystem g) Human health (causes of infectious diseases, methods of infection, prevention, immunity) and the importance of diet and exercise in maintaining health <p>Chemistry</p> <ul style="list-style-type: none"> h) Classification, composition, and particulate structure of matter (elements, compounds, mixtures, molecules, atoms, protons, neutrons, electrons) i) Physical and chemical properties of matter j) Mixtures and solutions (solvent, solute, concentration/dilution, effect of temperature on solubility) k) Properties and uses of common acids and bases l) Chemical change (transformation of reactants, evidence of chemical change, conservation of matter, common oxidation reactions – combustion, rusting, tarnishing) m) The role of electrons in chemical bonds <p>Physics</p> <ul style="list-style-type: none"> n) Physical states and changes in matter (explanations of properties in terms of movement and distance between particles; phase change, thermal expansion, and changes in volume and/or pressure) o) Energy forms, transformations, heat, and temperature p) Basic properties/behaviors of light (reflection, refraction, light and color, simple ray diagrams) and sound (transmission through media, loudness, pitch, amplitude, frequency) q) Electric circuits (flow of current; types of circuits - parallel/series) and properties and uses of permanent magnets and electromagnets r) Forces and motion (types of forces, basic description of motion, effects of density and pressure) <p>Earth Science</p> <ul style="list-style-type: none"> s) Earth’s structure and physical features (Earth’s crust, mantle, and core; composition and relative distribution of water, and composition of air) t) Earth’s processes, cycles, and history (rock cycle; water cycle; weather versus climate; major geological events; formation of fossils and fossil fuels) u) Earth’s resources, their use and conservation (e.g., renewable/nonrenewable resources, human use of land/soil, water resources) v) Earth in the solar system and the universe (phenomena on Earth - day/night, tides, phases of moon, eclipses, seasons; physical features of Earth compared to other bodies) |
|--|--|

4. Revised Items

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|---------------|----------------------------|-------------------------------|
| Item # | Original Item | Item # | Revised Item |
| Q11 | | Q9 | <i>Note: Renumbered items</i> |
| Q12 | | Q10 | |
| Q13 | | Q11 | |
| Q14 | | Q12 | |
| Q15 | | Q13 | |
| Q16 | | Q14 | |
| Q17 | | Q15 | |
| Q19 | | Q16 | |
| Q20 | | Q17 | |
| Q21 | | Q18 | |
| Q22 | | Q19 | |

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|--|----------------------------|---|
| Item # | Original Item | Item # | Revised Item |
| Q23 Q24 Q25 Q26 | | Q20 Q21 Q24 Q25 | |
| Q7 | <p>How would you characterize each of the following within your school? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low • Very low <p>a) Teachers’ understanding of the school’s curricular goals b) Teachers’ degree of success in implementing the school’s curriculum c) Teachers’ expectations for student achievement d) Teachers’ ability to inspire students e) Teachers working together to improve student achievement f) Parental involvement in school activities g) Parental commitment to ensure that students are ready to learn h) Parental expectations for student achievement i) Parental support for student achievement j) Parental pressure for the school to maintain high academic standards k) Students’ desire to do well in school l) Students’ ability to reach school’s academic goals m) Students’ respect for classmates who excel academically n) Clarity of the school’s educational objectives o) Collaboration between school leadership and teachers to plan instruction p) Amount of instructional support provided to teachers by school leadership q) School leadership’s support for teachers’ professional development</p> | Q7 | <p><i>Note: Five answer dimensions removed</i></p> <p>How would you characterize each of the following within your school? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Very high • High • Medium • Low • Very low <p>a) Teachers’ understanding of the school’s curricular goals b) Teachers’ degree of success in implementing the school’s curriculum c) Teachers’ expectations for student achievement d) Teachers’ ability to inspire students e) Parental involvement in school activities f) Parental commitment to ensure that students are ready to learn g) Parental expectations for student achievement h) Parental support for student achievement i) Students’ desire to do well in school j) Students’ ability to reach school’s academic goals k) Students’ respect for classmates who excel academically l) Collaboration between school leadership (including master teachers) and teachers to plan instruction</p> |
| Q11 | <p>How often do you feel the following way about being a teacher? <i>Fill in only one circle for each row.</i></p> | Q9 | <p><i>Note: Two answer dimensions removed</i></p> <p>How often do you feel the following way about being a teacher? <i>Fill in only one circle for each row.</i></p> |

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|--|----------------------------|---|
| Item # | Original Item | Item # | Revised Item |
| | <ul style="list-style-type: none"> • Very Often • Often • Sometimes • Never or almost never <p>a) I am content with my profession as a teacher</p> <p>b) I am satisfied with being a teacher at this school</p> <p>c) I find my work full of meaning and purpose</p> <p>d) I am enthusiastic about my job</p> <p>e) My work inspires me</p> <p>f) I am proud of the work I do</p> <p>g) I am going to continue teaching for as long as I can</p> | | <ul style="list-style-type: none"> • Very Often • Often • Sometimes • Never or almost never <p>a) I am content with my profession as a teacher</p> <p>b) I find my work full of meaning and purpose</p> <p>c) I am enthusiastic about my job</p> <p>d) My work inspires me</p> <p>e) I am proud of the work I do</p> |
| Q16 | <p>In your view, to what extent do the following limit how you teach this class? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Not at all • Some • A lot <p>a) Students lacking prerequisite knowledge or skills</p> <p>b) Students suffering from lack of basic nutrition</p> <p>c) Students suffering from not enough sleep</p> <p>d) Disruptive students</p> <p>e) Uninterested students</p> <p>f) Students with physical disabilities</p> <p>g) Students with mental, emotional, or psychological disabilities</p> | Q14 | <p><i>Note: Two dimensions added, one removed, and two reworded.</i></p> <p>In your view, to what extent do the following limit how you teach this class? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Not at all • Some • A lot <p>a) Students lacking prerequisite knowledge or skills</p> <p>b) Students suffering from lack of basic nutrition</p> <p>c) Students suffering from not enough sleep</p> <p>d) Students absent from class</p> <p>e) Disruptive students</p> <p>f) Uninterested students</p> <p>g) Students with mental, emotional, or psychological impairment</p> <p>h) Students with difficulties understanding the language of instruction</p> |
| Q19 | <p>In teaching science to the students in this class, how often do you ask them to do the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every lesson • About half the lessons • Some lessons • Never <p>a) Listen to me explain new science content</p> <p>b) Observe natural phenomena such as the weather or a plant growing and</p> | Q16 | <p><i>Note: Removed one dimension and reworded another.</i></p> <p>In teaching science to the students in this class, how often do you ask them to do the following? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every lesson • About half the lessons • Some lessons • Never <p>a) Listen to me explain new science content</p> <p>b) Observe natural phenomena and</p> |

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|---|----------------------------|---|
| Item # | Original Item | Item # | Revised Item |
| | <p>describe what they see</p> <ul style="list-style-type: none"> c) Watch me demonstrate an experiment or investigation d) Design or plan experiments or investigations e) Conduct experiments or investigations f) Present data from experiments or investigations g) Interpret data from experiments or investigations h) Use evidence from experiments or investigations to support conclusions i) Read their textbooks or other resource materials j) Have students memorize facts and principles k) Use scientific formulas and laws to solve routine problems l) Do field work outside the class m) Take a written test or quiz n) Work in mixed ability groups o) Work in same ability groups | | <p>describe what they see</p> <ul style="list-style-type: none"> c) Watch me demonstrate an experiment or investigation d) Design or plan experiments or investigations e) Conduct experiments or investigations f) Present data from experiments or investigations g) Interpret data from experiments or investigations h) Use evidence from experiments or investigations to support conclusions i) Read their textbooks or other resource materials j) Have students memorize facts and principles k) Use scientific formulas and laws to solve routine problems l) Do field work outside the class m) Work in mixed ability groups n) Work in same ability groups |
| Q21C | <p>If Yes, How often do you have the students do the following activities on computers during science lessons? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every day • Once or twice a week • Once or twice a month • Never or almost never <ul style="list-style-type: none"> a) Practice skills and procedures b) Look up ideas and information c) Do scientific procedures or experiments d) Study natural phenomena through simulations | Q18C | <p><i>Note: Modified stem wording and added one dimension</i></p> <p>How often do you have the students do the following activities on computers during science lessons? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every or almost every day • Once or twice a week • Once or twice a month • Never or almost never <ul style="list-style-type: none"> a) Practice skills and procedures b) Look up ideas and information c) Do scientific procedures or experiments d) Study natural phenomena through simulations e) Prepare reports and presentations |
| Q22 | <p>The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose “Mostly taught before this year.” If a topic was taught half this year but not yet completed, please choose “Mostly taught this year.” If a topic is not in the curriculum, please choose</p> | Q19 | <p><i>Note: Several dimensions were added, removed, and reworded.</i></p> <p>The following list includes the main topics addressed by the TIMSS science test. Choose the response that best describes when the students in this class have been taught each topic. If a topic was in the curriculum before the fourth grade, please choose “Mostly taught before this year.” If a topic was taught half this year but not yet completed, please choose “Mostly taught this year.” If a topic is not in the curriculum, please choose</p> |

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|--|----------------------------|--|
| Item # | Original Item | Item # | Revised Item |
| | <p>“Not yet taught or just introduced.” Fill in only one circle for each row.</p> <ul style="list-style-type: none"> • Mostly taught before this year • Mostly taught this year • Not yet taught or just introduced <p>Biology</p> <p>a) Differences among major taxonomic groups of organisms (plants, animals, fungi, mammals, birds, reptiles, fish, amphibians)</p> <p>b) Major organs and organ systems in humans and other organisms (structure/function, life processes that maintain stable bodily conditions)</p> <p>c) Cells, their structure and functions, including respiration and photosynthesis as cellular processes</p> <p>d) Life cycles, sexual reproduction, and heredity (passing on of traits, inherited versus acquired/learned characteristics)</p> <p>e) Role of variation and adaptation in survival/extinction of species in a changing environment (including fossil evidence for changes in life on Earth over time)</p> <p>f) Interdependence of populations of organisms in an ecosystem (e.g., energy flow, food webs, competition, predation) and factors affecting population size in an ecosystem</p> <p>g) Human health (causes of infectious diseases, methods of infection, prevention, immunity) and the importance of diet and exercise in maintaining health</p> <p>Chemistry</p> <p>h) Classification, composition, and particulate structure of matter (elements, compounds, mixtures, molecules, atoms, protons, neutrons, electrons)</p> <p>i) Physical and chemical properties of matter</p> <p>j) Mixtures and solutions (solvent, solute, concentration/dilution, effect of temperature on solubility)</p> <p>k) Properties and uses of common acids and bases</p> <p>l) Chemical change (transformation of reactants, evidence of chemical change, conservation of matter, common oxidation reactions – combustion, rusting, tarnishing)</p> | | <p>“Not yet taught or just introduced.” Fill in only one circle for each row.</p> <ul style="list-style-type: none"> • Mostly taught before this year • Mostly taught this year • Not yet taught or just introduced <p>Biology</p> <p>a) Differences among major taxonomic groups of organisms (plants, animals, fungi, mammals, birds, reptiles, fish, amphibians, insects)</p> <p>b) Major organs and organ systems in humans and other organisms (structure/function, life processes)</p> <p>c) Cells, their structure and functions, including respiration and photosynthesis as cellular processes</p> <p>d) Life cycles, sexual reproduction, and heredity (inherited versus acquired/learned characteristics)</p> <p>e) Role of variation and adaptation in survival/extinction of species (including fossil evidence)</p> <p>f) Interdependence of populations of organisms in an ecosystem (e.g., carbon and water cycles, energy flow, food webs, competition, predation, human impacts on ecosystems)</p> <p>g) Human health (e.g., causes, transmission, and prevention of common infectious diseases, immunity) and the importance of diet, exercise, and other lifestyle choices in maintaining health</p> <p>Chemistry</p> <p>h) Particulate structure, classification, and composition of matter (protons, neutrons, electrons, atoms, molecules, elements, compounds, mixtures)</p> <p>i) The periodic table as an organizing principle for the known elements</p> <p>j) Physical and chemical properties of matter</p> <p>k) Mixtures and solutions (e.g., solvent, solute, concentration/dilution)</p> <p>l) Properties of common acids and bases (e.g., acids have pH less than 7, reactions with indicators produce color changes, acids and bases neutralize each other)</p> <p>m) Characteristics of chemical reactions (e.g., transformation of reactants, evidence of chemical change)</p> <p>n) Matter and energy in chemical reactions (conservation of matter,</p> |

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|--|----------------------------|---|
| Item # | Original Item | Item # | Revised Item |
| | <p>m) The role of electrons in chemical bonds</p> <p>Physics</p> <p>n) Physical states and changes in matter (explanations of properties in terms of movement and distance between particles; phase change, thermal expansion, and changes in volume and/or pressure)</p> <p>o) Energy forms, transformations, heat, and temperature</p> <p>p) Basic properties/behaviors of light (reflection, refraction, light and color, simple ray diagrams) and sound (transmission through media, loudness, pitch, amplitude, frequency)</p> <p>q) Electric circuits (flow of current; types of circuits - parallel/series) and properties and uses of permanent magnets and electromagnets</p> <p>r) Forces and motion (types of forces, basic description of motion, effects of density and pressure)</p> <p>Earth Science</p> <p>s) "Earth's structure and physical features (Earth's crust, mantle, and core; composition and relative distribution</p> <p>t) of water, and composition of air"</p> <p>u) Earth's processes, cycles, and history (rock cycle; water cycle; weather versus climate; major geological events; formation of fossils and fossil fuels)</p> <p>v) Earth's resources, their use and conservation (e.g., renewable/nonrenewable resources, human use of land/soil, water resources)</p> <p>w) Earth in the solar system and the universe (phenomena on Earth - day/night, tides, phases of moon, eclipses, seasons; physical features of Earth compared to other bodies)</p> | | <p>familiar exothermic and endothermic reactions, factors affecting reaction rates)</p> <p>o) The role of electrons in chemical bonds</p> <p>Physics</p> <p>p) Physical states and changes in matter (explanations of properties in terms of movement and distance between particles; phase change, changes in volume and/or pressure, physical changes)</p> <p>q) Energy transformation and transfer (e.g., forms of energy, energy conservation, heat temperature, equilibrium)</p> <p>r) Basic properties/behaviors of light (reflection, refraction, color, shadows, simple ray diagrams)</p> <p>s) Basic properties/behaviors of sound (vibrations that produce sound, transmission through media, loudness, pitch)</p> <p>t) Electric circuits (e.g., electrical conductors/insulators and the flow of electricity in series/parallel circuits)</p> <p>u) Properties and uses of permanent magnets and electromagnets</p> <p>v) Motion and forces (e.g., basic description of motion, common mechanical forces, properties of forces, effects of forces, simple machines, buoyancy, effects of density and pressure)</p> <p>Earth Science</p> <p>w) Earth's structure and physical features (e.g., Earth's crust, mantle, and core; composition and relative distribution of water; composition of Earth's atmosphere)</p> <p>x) Earth's processes, cycles, and history (e.g., rock cycle, major geological events, formation of fossils and fossil fuels, water cycle, weather versus climate)</p> <p>y) Earth's resources, their use, and conservation (e.g., renewable/nonrenewable resources, human use of land and water resources)</p> <p>z) Earth in the Solar System and the universe (phenomena on Earth: seasons, eclipses, tides, phases of moon; members of the Solar System; physical features of Earth)</p> |

APPENDIX C.1: SUMMARY OF U.S. CHANGES TO TIMSS INSTRUMENTS

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|--|----------------------------|---|
| Item # | Original Item | Item # | Revised Item |
| Q24 | <p>How much emphasis do you place on the following sources to monitor students' progress in science? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Major emphasis • Some emphasis • Little or no emphasis <p>a) Assessment of students' ongoing work b) Classroom tests (for example, teacher-made or textbook tests) c) National or regional achievement tests</p> | Q21 | <p><i>Note: Item stem reworded, categories changed, and dimensions reworded, added, removed.</i></p> <p>How much importance do you place on the following assessment strategies in science? <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Major • Some • Little • None <p>a) Observing students as they work b) Asking students to answer questions during class c) Short, regular written assessments d) Longer tests (e.g., unit tests or exams) e) Long-term projects</p> |

G. Student Questionnaire – Grade 8

1. New Adaptation of all items (not already included in the U.S. 2015 main study version)

| TIMSS 2019 U.S. Field Test (draft) | | |
|---|---|---------------------------|
| 2015 U.S. adaptation | 2019 Field Test U.S. adaptation | Item(s) |
| Your school has agreed to participate in TIMSS 2015 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide. | Your school has agreed to participate in TIMSS 2019 (Trends in International Mathematics and Science Study), an educational research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). TIMSS measures trends in student achievement in mathematics and science and studies differences in national education systems in almost 60 countries in order to help improve teaching and learning worldwide. | <i>Note: Year updated</i> |

3. Deleted Items (entire stem)

| Item Number | Deleted Text/Item |
|-------------|--|
| Q7 | <p>How many digital information devices are there in your home? Count computers, tablets, smartphones, smart TVs, and e-readers. (Do not count other devices.)</p> <p><i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • None • 1-3 devices • 4-6 devices • 7-10 devices • 5. More than 10 devices |
| Q16 | <p>How often do you use a computer or tablet in each of these places for schoolwork (including classroom tasks, homework, studying outside of class)?</p> <p><i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Every day or almost every day • Once or twice a week • Once or twice a month • Never or almost never <p>a) At home b) At school c) Some other place</p> |

4. Revised Items

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|--|--|---|--|
| Item # | Original Item | Item # | Revised Item |
| Q6 Q8 Q9 Q10 Q11 Q12 Q4 Q5 Q13 Q14 Q15 Q17 Q18 Q19 Q20 Q21 Q22 Q23 Q24 Q25 Q26 Q27 Q28 Q29 Q30 Q31 Q32 | | Q4 Q5 Q6 Q7 Q8 Q9 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17 Q18 Q19 Q20 Q21 Q22 Q23 Q24 Q25 Q26 Q27 Q28 Q29 Q30 | <i>Renumbered items</i> |
| Q9A Q9B | <p>What is the highest level of education completed by your mother (or stepmother or female legal guardian)? <i>Fill in one oval only.</i></p> <ul style="list-style-type: none"> • Less than high school • Some high school • High school graduate • Associate's degree (2-year college program) • Bachelor's degree (4-year college program) • Master's degree or professional degree (MD, DDS, lawyer, minister) • Doctorate (Ph.D., or Ed.D.) • I don't know <p>What is the highest level of education completed by your father (or stepfather or male legal guardian)? <i>Fill in one oval only.</i></p> <ul style="list-style-type: none"> • Less than high school • Some high school • High school graduate • Associate's degree (2-year college program) • Bachelor's degree (4-year college program) • Master's degree or professional degree | Q6A Q6A Q6B | <p><i>Note: Item stem and dimensions reworded and combined into one question with parts A and B. Instructions changed from "oval" to "circle."</i></p> <p>The following question is about your Parent/Guardian A and Parent/Guardian B. If you have only one parent/guardian, answer for Parent/Guardian A. If you have two parents/guardians, choose one for Parent/Guardian A and the other for Parent/Guardian B. What is the highest level of education completed by your parents/guardians? <i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Less than high school • Some high school • High school graduate • Associate's degree (2-year college program) • Bachelor's degree (4-year college program) • Master's degree or professional degree (MD, DDS, lawyer, minister) • Doctorate (Ph.D., or Ed.D.) • I don't know • Not applicable <p>a) Parent/Guardian A</p> |

APPENDIX C.1: SUMMARY OF U.S. CHANGES TO TIMSS INSTRUMENTS

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|---|----------------------------|---|
| Item # | Original Item | Item # | Revised Item |
| | <p>(MD, DDS, lawyer, minister)</p> <ul style="list-style-type: none"> • Doctorate (Ph.D., or Ed.D.) • I don't know | | <p>b) Parent/Guardian B</p> |
| <p>Q11A Q11B</p> | <p>Was your mother (or stepmother or female legal guardian) born in the United States? (“United States” includes the 50 states, its territories, the District of Columbia, and U.S. military bases abroad) <i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Yes • No • I don't know <p>Was your father (or stepfather or male legal guardian) born in the United States? <i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Yes • No • I don't know | <p>Q08 Q08A</p> | <p><i>Note: Item stem and dimensions reworded and combined into one question.</i></p> <p>Were your parents/guardians born in the United States? <i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Yes • No • I don't know • Not applicable <p>a) Parent/Guardian A b) Parent/Guardian B</p> |
| <p>Q13A</p> | <p>About how often are you absent from school? <i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Once a week or more • Once every two weeks • Once a month • Never or almost never | <p>Q12A</p> | <p><i>Note: One answer dimension added.</i></p> <p>About how often are you absent from school? <i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Once a week • Once every two weeks • Once a month • Once every two months • Never or almost never |
| <p>Q15</p> | <p>How often do you eat breakfast on school days? <i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Every day • Most days • Sometimes • Never or almost never | <p>Q14</p> | <p><i>Note: Item stem reworded and answer dimensions added.</i></p> <p>How often do you feel this way when you arrive at school? <i>Fill in one circle only.</i></p> <ul style="list-style-type: none"> • Every day • Almost every day • Sometimes • Never <p>a) I feel tired b) I feel hungry</p> |
| <p>Q18</p> | <p>What do you think about your school? Tell how much you agree with these statements. <i>Fill in only one circle for each row.</i></p> <ul style="list-style-type: none"> • Agree a lot | <p>Q16</p> | <p><i>Note: Two answer dimensions added</i></p> <p>What do you think about your school? Tell how much you agree with these statements. <i>Fill in only one circle for each row.</i></p> |

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| Item # | Original Item | Item # | Revised Item |
| | <ul style="list-style-type: none"> • Agree a little • Disagree a little • Disagree a lot <p>a) I like being in school b) I feel safe when I am at school c) I feel like I belong at this school d) I like to see my classmates at school e) Teachers at my school are fair to me f) I am proud to go to this school g) I learn a lot in school</p> | | <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little • Disagree a lot <p>a) I like being in school b) I feel safe when I am at school c) I feel like I belong at this school d) Teachers at my school are fair to me e) I am proud to go to this school</p> |
| Q19 | <p>During this school year, how often have other students from your school done any of the following things to you (including through texting or the Internet)? Fill in only <i>one</i> circle for each row.</p> <ul style="list-style-type: none"> • At least once a week • Once or twice a month • A few times a year • Never <p>a) Made fun of me or called me names b) Left me out of their games or activities c) Spread lies about me d) Stole something from me e) Hit or hurt me (e.g., shoving, hitting, kicking) f) Made me do things I didn't want to do g) Shared embarrassing information about me h) Posted embarrassing things about me online i) Threatened me</p> | Q17 | <p><i>Note: Reworded several dimensions and added several.</i></p> <p>During this school year, how often have other students from your school done any of the following things to you (including through texting or the Internet)? Fill in only <i>one</i> circle for each row.</p> <ul style="list-style-type: none"> • At least once a week • Once or twice a month • A few times a year • Never <p>a) Made fun of my clothes b) Said mean things about my physical appearance (e.g., my hair, my size) c) Spread lies about me d) Shared my secrets with others e) Refused to talk to me f) Insulted a member of my family g) Stole something from me h) Made me do things I didn't want to do i) Shared embarrassing information or photos of me j) Send me mean messages or e-mails. k) Threatened me l) Physically hurt me m) Excluded me from their group (e.g., parties, messaging) n) Damaged something of mine on purpose</p> |
| Q21 | <p>How much do you agree with these statements about your mathematics lessons? Fill in only <i>one</i> circle for each row.</p> <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little • Disagree a lot | Q19 | <p><i>Note: Deleted one dimension and added three.</i></p> <p>How much do you agree with these statements about your mathematics lessons? Fill in only <i>one</i> circle for each row.</p> <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little • Disagree a lot |

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| Item # | Original Item | Item # | Revised Item |
| | <ul style="list-style-type: none"> a) I know what my teacher expects me to do b) My teacher is easy to understand c) I am interested in what my teacher says d) My teacher gives me interesting things to do e) My teacher has clear answers to my questions f) My teacher is good at explaining mathematics g) My teacher lets me show what I have learned h) My teacher does a variety of things to help us learn i) My teacher tells me how to do better when I make a mistake j) My teacher listens to what I have to say | | <ul style="list-style-type: none"> a) I know what my teacher expects me to do b) My teacher is easy to understand c) My teacher gives me interesting things to do d) My teacher has clear answers to my questions e) My teacher is good at explaining mathematics f) My teacher lets me show what I have learned g) My teacher does a variety of things to help us learn h) My teacher tells me how to do better when I make a mistake i) My teacher listens to what I have to say j) My teacher links new lessons to what I already know k) My teacher explains a topic again when we don't understand l) My teacher lets me explain why my answer is correct m) My teacher asks me to work on mathematics problems on my own n) My teacher asks us to discuss solutions to problems with our classmates |
| Q25 | <p>How much do you agree with these statements about your science lessons? Fill in only one circle for each row.</p> <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little • Disagree a lot <ul style="list-style-type: none"> a) I know what my teacher expects me to do b) My teacher is easy to understand c) I am interested in what my teacher says d) My teacher gives me interesting things to do e) My teacher has clear answers to my questions f) My teacher is good at explaining science g) My teacher lets me show what I have learned h) My teacher does a variety of things to help us learn i) My teacher tells me how to do better when I make a mistake j) My teacher listens to what I have to | Q23 | <p><i>Note: Deleted one dimension and added three.</i></p> <p>How much do you agree with these statements about your science lessons? Fill in only one circle for each row.</p> <ul style="list-style-type: none"> • Agree a lot • Agree a little • Disagree a little • Disagree a lot <ul style="list-style-type: none"> a) I know what my teacher expects me to do b) My teacher is easy to understand c) My teacher gives me interesting things to do d) My teacher has clear answers to my questions e) My teacher is good at explaining science f) My teacher lets me show what I have learned g) My teacher does a variety of things to help us learn h) My teacher tells me how to do better when I make a mistake i) My teacher listens to what I have to |

APPENDIX C.1: SUMMARY OF U.S. CHANGES TO TIMSS INSTRUMENTS

| 2015 MS Final U.S. Version | | 2019 FT Draft U.S. Version | |
|----------------------------|---------------|----------------------------|--|
| Item # | Original Item | Item # | Revised Item |
| | say | | say j) My teacher links new lessons to what I already know k) My teacher lets me explains a topic again when we don't understand. l) My teacher lets me explain why my answer is correct m) My teacher asks me to conduct science experiments n) My teacher encourages me to discuss the results of our science experiments |