TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY (TIMSS 2015) FIELD TEST AND RECRUITMENT FOR FIELD TEST AND MAIN STUDY

REQUEST FOR OMB CLEARANCE
OMB# 1850-0695 v.3

SUPPORTING STATEMENT PART A

Submitted by:

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U.S. Department of Education
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PREFACE

The *Trends in Mathematics and Science Study* (TIMSS) is an international assessment of fourth and eighth grade students' achievement in mathematics and science. Since its inception in 1995, TIMSS has continued to assess students every 4 years (1995, 1999, 2003, 2007, 2011), with the next TIMSS assessment, TIMSS 2015, being the sixth iteration of the study. Participation in this study by the United States at regular intervals provides data on current and past education policies and a comparison of U.S. education policies with its international counterparts. In TIMSS 2011, 50 countries and 7 other education systems participated at grade 4, and 42 countries and 14 other education systems participated at grade 8. The United States will participate in TIMSS 2015 to continue to monitor the progress of its students compared to that of other nations and to provide data on factors that may influence student achievement.

Periodically, TIMSS has also conducted an assessment of advanced mathematics and physics of students at the end of secondary school (1995 and 2008). The United States participated in TIMSS Advanced in 1995, but not in 2008. Because of the current strong policy interest in preparedness for college and for careers in science, technology, engineering, and mathematics (STEM) fields, the U.S. plans to participate in TIMSS Advanced in 2015.

TIMSS is conducted by the International Association for the Evaluation of Educational Achievement (IEA), an international collective of research organizations and government agencies that create the frameworks used to develop the assessment, the background questionnaires, and the studies' timeline. IEA decides and agrees upon a common set of standards and procedures for collecting and reporting data, and defines the studies' timeline, all of which must be followed by all participating countries. As a result, TIMSS is able to provide a reliable and comparable measure of student skills in participating countries. In the U.S., the National Center for Education Statistics (NCES) sponsors this study in collaboration with the IEA and other contractors (Westat, Avar Consulting (Avar), AIR, and Hager Sharp) to ensure proper implementation of the study and adoption of practices in adherence to the IEA's standards. Participation in TIMSS also allows NCES to meet its mandate of acquiring and disseminating data on educational activities and student achievement in the United States compared with foreign nations [The Educational Sciences Reform Act of 2002 (ESRA 2002) 20 U.S.C., Section 9543].

In reporting achievement in mathematics and science at grades 4 and 8, TIMSS results provide four benchmarks (*Advanced*, *High*, *Medium*, and *Low*) for each content domain depending on the grade and subject assessed (fourth and eighth grades in mathematics and science). Although the fourth and eighth grade content domains differ, the cognitive domains (knowing, applying, and reasoning) remain the same for both grades and subjects to understand the problem-solving skills learned and applied throughout primary and middle school years. TIMSS also reports on a variety of issues related to the education context for the students in the sample, including instructional practices, school resources, and curriculum implementation.

TIMSS Advanced will report the numbers and proportions of the overall population who are participating in physics and advanced mathematics at the end of secondary school. In advanced mathematics, the assessment framework covers algebra, calculus, and geometry. In physics, the framework covers mechanics, electricity/magnetism, heat/temperature, and atomic/nuclear physics. Student achievement will be reported based on international benchmarks (*Advanced*, *High*, *Medium*, and *Low*), and will include contextual data about education practices, resources, and student preparation and attitudes, that can be used to inform education policy discussions about STEM fields.

Compared to previous assessment cycles, TIMSS 2015 differs in several ways:

- Unlike TIMSS 2011, TIMSS 2015 will not involve the IEA's bilateral coordination of TIMSS with the International Study Center's Progress in International Reading Literacy Study (PIRLS) assessment.

- Unlike the 2011 assessment, there will be no federally funded state benchmarking.
- Participation in TIMSS Advanced, which will measure achievement in advanced mathematics and physics for students in their last year of secondary school, represents the first U.S. participation since 1995.
- For TIMSS 2015, class and student lists from participating schools will be gathered electronically using an adaptation of a secure E-filing process. E-filing provides advantageous features such as efficiency and data quality checks. Schools will access the E-filing system through the new MyTIMSS web site.
- TIMSS 2015 may involve a computer-based assessment pilot during the main study period.
- TIMSS 2015 may include a parent questionnaire at grade 4; however, the United States will not participate in the parent questionnaire.

In preparation for the TIMSS 2015 main study, all countries are asked to implement a 2014 field test. The United States will participate in the TIMSS Advanced field test but not the TIMSS field test at grades 4 and 8. The purpose of the TIMSS Advanced field test is to evaluate new assessment items and background questions to ensure practices that promote low exclusion rates, and to ensure that classroom and student sampling procedures proposed for the main study are successful. In selecting a school sample for this purpose, it is important to minimize the burden on schools, districts, and states, to minimize impact on these entities while also ensuring that the field test data are collected effectively. TIMSS staff will also work to help respondents understand the study's value relative to burden imposed, and to ensure a high level of school participation in the main study.

Data collection for the TIMSS Advanced field test will occur from March through April 2014. The United States plans to recruit a total of 40 schools (most public and a few private) at grade 12, and assess 700 students per subject (1,400 total). Only students who are or have taken courses identified as eligible according to the TIMSS Advanced frameworks will be sampled.

In addition to the field test, NCES plans to conduct cognitive labs at grades 4 and 8 and for TIMSS Advanced at grade 12. Focus groups of school principals and/or high school students may be conducted to examine ways to increase participation. A separate OMB request will be submitted for these activities.

The U.S. TIMSS main study will be conducted from April through May, 2015. The main study will involve a nationally-representative sample of students in the target population for each subject from 300 schools at each grade (4 and 8), and 250 schools for TIMSS Advanced in grade 12.

This submission describes the overarching plan for all phases of the data collection, including the 2015 main study. In addition to the supporting statements Parts A and B, Appendix A provides field test and main study recruitment materials, consisting of letters to state and district officials and school principals, and text for a TIMSS brochure, "Frequently Asked Questions," and a "Summary of Activities". Parental consent materials are provided in Appendix B, and the draft TIMSS 2015 field test questionnaire items and TIMSS Advanced 2008 (the most recent version) questionnaire items are provided in Appendix C. The 2008 version of the TIMSS Advanced questionnaires from their last administration are currently being adapted by the IEA for the TIMSS Advanced 2015 field test. The TIMSS Advanced 2008 questionnaire versions included in this package will be replaced with preliminary international versions of the TIMSS Advanced field test questionnaires as soon as they are released by the IEA, in November 2013. When NCES receives those preliminary international versions, NCES will share copies with OMB; NCES will have very limited time to comment on them. The final versions of the TIMSS Advanced field test questionnaires, including U.S. adaptations, will be available in early January 2014, at which point NCES will submit them to OMB for approval as a change request.

Because TIMSS is a collaborative effort among many parties, the United States must adhere to the international schedule set forth by the IEA, including the availability of draft and final questionnaires. In order to meet the

international data collection schedule for the spring 2014 field test, recruitment activities must begin in November 2013. Recruitment for the main study will begin in May of 2014 to align with recruitment for other NCES studies (e.g. the National Assessment of Education Progress, NAEP), and for schools to put the assessment on their calendars. We expect the main study materials and procedures to be closely based on those used in the field test. Therefore, this submission requests approval for:

1. recruiting for the TIMSS Advanced field test in 2014;
2. conducting the 2014 field test data collection for TIMSS Advanced (grade 12);
3. recruiting for the 2015 TIMSS main study (at grades 4, 8 and 12); and
4. a description of the overarching plan for all of the phases of the data collection, including the 2015 main study.[1]

One change request is expected to follow this submission. In early January 2014, we expect to submit a change-request memo with the final versions of the TIMSS Advanced 2015 field test questionnaires. In late 2014, we will submit a clearance package, with a 30-day notice published in the federal register, which will include the final main study instruments for data collection in April-May, 2015. The main study questionnaires will be a subset of the field test instruments.

A. Justification

A.1 Importance of Information

Benchmarking of U.S. student achievement against other countries continues to be of high interest to education policymakers, and informs policy discussions of economic competitiveness and workforce and post-secondary preparedness. TIMSS provides a unique opportunity to compare U.S. students‘ mathematics and science knowledge and skills at fourth and eighth grade with that of their peers in countries around the world. Science, technology, engineering, and mathematics (STEM) preparedness is key to economic improvement. The TIMSS Advanced component is the only international assessment that provides information about the achievementm and educational context of students who take advanced mathematics and physics courses in high school, preparing them for further education and careers in science, engineering, and technology fields.

The continuation of U.S. participation allows for the study of past and current education policies that have shaped science and mathematics achievement over the past 20 years. Furthermore, participating countries are not only able to obtain information about students' knowledge and abilities in the specified subjects, but also about the cultural environments, teaching practices, curriculum goals, and institutional arrangements that are associated with student achievement in the respective subject areas.

TIMSS complements what we learn from national assessments such as the National Assessment of Educational Progress (NAEP) by identifying the strengths and weaknesses of student science and mathematics achievement relative to participating countries around the world. It provides valuable benchmarking information about educational polices enacted in other countries and policies that could be applied to U.S. educational practices.

[1] The materials that will be used in the 2015 main study will be based upon the field test materials included in this submission. Additionally, this submission is designed to adequately justify the need for and overall practical utility of the full study and to present the overarching plan for all of the phases of the data collection, providing as much detail about the measures to be used as is available at the time of this submission. As part of this submission, NCES is publishing a notice in the Federal Register allowing first a 60- and then a 30-day public comment period. For the final proposal for the full study, after the field test, NCES will publish a notice in the Federal Register allowing an additional 30-day public comment period on the final details of 2015 main study.

Based on earlier TIMSS data releases, it is likely that the results of these studies will draw great attention in the United States and elsewhere. It is therefore expected that TIMSS will contribute to ongoing national and international debates and efforts to improve mathematics and science learning and achievement.

A.2 Purposes and Uses of Data

TIMSS assesses mathematics and science knowledge and skills at grades 4 and 8, and advanced mathematics and science knowledge and skills of select students at grade 12. TIMSS is designed to align broadly with curricula in the participating countries. The results, therefore, suggest the degree to which students have learned concepts and skills likely to have been taught in school. TIMSS also collects background information on students, teachers, schools, curricula, and official education policies in order to allow cross-national comparison of educational contexts that may be related to student achievement.

Data compiled and collected from TIMSS 2015 allows for evidence-based decisions to be made for the purposes of educational improvement. Each successive participation in TIMSS provides trend information about student achievement in mathematics and science relative to other countries, as well as indicators that show how this achievement relates to demographic and curricular, school, teacher, and student factors that provide the educational context for achievement. This high quality, internationally comparative trend data provides key information to inform education policy discussions.

Through the participation in TIMSS and other international assessment programs, NCES is able to provide comparative indicators on student performance and school practices across countries in order to benchmark U.S. student performance, and to suggest hypotheses about the relationship between student performance and factors that may influence performance as well as areas in which students have strengths or weaknesses. The international studies identify differences among countries over time in instructional practices, school policies, and opportunity-to-learn that can lead to discussions about how to organize instruction.

This collection of data is consistent with the NCES mandate. The enabling legislation of the National Center for Education Statistics [Section 406 of the General Education Provisions Act, as amended (20 U.S.C. 1221e-1)] specifies that "The purpose of the Center [NCES] shall be to collect and analyze and disseminate statistics and other information related to education in the United States and in other nations." The Educational Sciences Reform Act of 2002 (ESRA 2002: 20 U.S.C., Section 9543) also specifies that NCES shall collect, report, analyze, and disseminate statistical data related to education in the United States and in other nations, including acquiring and disseminating data on educational activities and student achievement in the United States compared with foreign nations. In addition to being essential for any international perspective on mathematics and science knowledge and skills, U.S. participation fulfills both the national and international aspects of NCES' mission.

TIMSS 2015 Components

The mathematics and science assessments at grades 4 and 8 are organized around a content dimension that specifies the subject matter to be assessed and a cognitive dimension that specifies the thinking processes to be assessed. The cognitive domains are the same in mathematics and science: knowing, applying, and reasoning. The TIMSS 2015 frameworks are similar to 2011, but have been slightly revised or updated to provide more specificity for item writers, and to better reflect current curricula in participating countries. There were no revisions to the content domains or cognitive domains, nor were there changes to the target percentages for the content domains or cognitive domains at either subject at either grade.

In fourth grade mathematics the cognitive content domains include: number, geometric shapes and measures, and data display. More advanced content in these three domains are assessed in eighth grade, supplemented by a data

and chance domain. TIMSS assesses a range of problem-solving situations within mathematics, with about two-thirds of the questions requiring students to use applying and reasoning skills.

In science at fourth grade, the content domains include: life science, physical science, and earth science. At eighth grade the content domains transition to a more discipline-based approach, reflecting the differences in instruction from elementary school. The content domains at eighth grade are: biology, chemistry, physics, and earth science. TIMSS 2015 will also measure science practices and science inquiry, reflecting recent emphasis on these skills in many countries' curricula and content standards.

TIMSS Advanced assesses students in the twelfth grade who have taken advanced mathematics and physics coursework. The cognitive domains are the same as fourth and eighth grade (knowing, applying, and reasoning), and emphasize the thinking processes students are expected to use when answering the advanced mathematics and physics questions.

The advanced mathematics framework has three content domains: algebra, calculus, and geometry. In physics, the content domains are: mechanics and thermodynamics, electricity and magnetism, wave phenomena, and atomic/nuclear physics.

Assessment Instruments

TIMSS. In order to minimize burden and to ensure broad subject-matter coverage, TIMSS will use a matrix sampling approach where the mathematics and science items at each grade level are organized into a set of test booklets, with each student taking only one booklet.

TIMSS Advanced. Matrix sampling will also be used in TIMSS Advanced so that students will take only a subset of the items in one subject: advanced mathematics or physics.

Questionnaires

The background questionnaires for TIMSS 2015 are being developed to address a background questions framework developed internationally. The United States will adapt the questions to fit the U.S. education context, including adding a few questions, such as about the race/ethnicity of students. All but the student questionnaire will be offered online, with a paper and pencil backup. Students will only receive a paper and pencil questionnaire.

School Questionnaire. A representative from each participating school will be asked to provide information on mathematics and science resources, teacher availability and retention, principal leadership, school emphasis on academic success, school climate, and parental involvement in school activities.

Teacher Questionnaire. At grades 4 and 8, mathematics and science teachers of students in selected classes will be asked to complete a teacher questionnaire. For the Advanced study, all teachers of the eligible courses in selected schools will be asked to complete the relevant teacher questionnaire (for either advanced mathematics or physics).

Teacher questionnaires will include questions about teacher preparation and experience, mathematics and science topics taught, instructional resources and technology, instructional time, instructional engagement, and classroom assessment.

Parent Questionnaire. Parents/guardians of the grade 4 students will be asked to complete a questionnaire about home resources for learning, home use of language of instruction, parental educational expectations and academic socialization, and early literacy, numeracy, and science activities. The United States will not participate in the parent questionnaire in 2015.

Student Questionnaire. Student information will be collected about home resources, motivation, self-concept, self-efficacy, and student characteristics such as gender and race/ethnicity.

A.3 Improved Information Technology (Reduction of Burden)

The TIMSS 2015 design and procedures are prescribed internationally and data collection involves paper and pencil student assessments and questionnaires, as well as optional online or paper and pencil school, teacher, and parent questionnaires. Each participating nation is expected to adhere to the internationally prescribed design. In the United States, the school and teacher questionnaires will be made available to school administrators and teachers online as the main mode of administration, with a paper and pencil backup to facilitate user preference for participation. The online questionnaires will be provided on the secure NCES server, so that NCES will be able to control access to the data to ensure confidentiality and minimize disclosure risk.

A communication website, MyTIMSS USA, will be used for TIMSS 2015 during the field test and main study in order to provide a simple, single source of information to engage and maintain high levels of school involvement. This portal will be used throughout the assessment cycle to inform schools of their tasks and to provide them with easy access to information tailored for their anticipated needs. We plan to gather class and student lists from participating schools electronically using an adaptation of Westat's secure E-filing process. E-filing is an electronic system for submitting lists of student information, including student background information in school records. It has been used successfully in NAEP for about 10 years, and was used in the PISA 2012 assessment. The E-filing system provides advantageous features such as efficiency and data quality checks. Schools will access the E-filing system through the MyTIMSS web site.

Currently, the IEA plans for a TIMSS pilot of a computer-based TIMSS assessment following (but as part of) the main study to prepare for transition to computer-based TIMSS assessments in 2019 and beyond.

A.4 Efforts to Identify Duplication

In the United States, mathematics and science achievement is systematically assessed at (1) the Federal level, where trend data have been collected on a fairly regular basis since 1971, through the National Assessment of Educational Progress (NAEP); (2) the state level, where data are routinely collected as part of state testing programs, though they vary across the states in terms of the frequency of testing, age/grades tested, and types of cognitive items administered; and (3) the district level, where data are collected through the use of commercially or locally developed standardized tests as well as tests developed in conjunction with the instructional programs used in schools. TIMSS 2015 does not duplicate these assessments.

TIMSS 2015 is part of a program of international cooperative studies of educational achievement supported and funded, in part, by the U.S. Department of Education. These studies represent the U.S. participation in international studies involving approximately 60-65 countries. As part of international cooperative studies, the United States must collect the same information at the same time as the other nations for purposes of making both valid international comparisons with other countries and with the previous TIMSS data. While some studies in the United States collect similar, though not identical, kinds of information (e.g., NAEP), the data from those studies cannot be substituted for the information collected in TIMSS in that they do not allow for comparisons outside the United States. Furthermore, the data collected through TIMSS is based on unique frameworks that are not shared by any other state, national, or international data collection effort. In order to participate in these international studies, the United States must agree to administer the same core instruments that are administered in the other countries. Because the items measuring mathematics and science achievement have been developed with intensive international coordination, any changes to the instruments require international coordination and approval.

The TIMSS Advanced study will provide the only international measure of the achievement of students who have opportunity to learn advanced mathematics and physics. No other study provides information about how many

students are participating in highly specialized STEM course materials in a global context, along with their achievement and educational context supporting that achievement.

A.5 Minimizing Burden for Small Entities

No small entities are part of this sample. The school samples for TIMSS contain small-, medium- and large-size schools, including private schools, selected based on probability proportionate to their size. All school sizes are needed to ensure an appropriate representation of each type of school in the selected sample of schools. Burden will be minimized wherever possible. For example, schools will be selected so as to avoid overlap with other NCES assessments such as NAEP and PISA. In addition, contractor staff will conduct all test administration, and will assist with parental notification, sampling, and other tasks as much as possible within each school. In grades 4 and 8 the assessment will be administered to intact classes to minimize disruption to school schedules.

A.6 Frequency of Data Collection

The field test data collection for TIMSS Advanced at grade 12 is scheduled for March 1 through April 15, 2014. The full-scale data collection is scheduled for April through May, 2015. This schedule is prescribed by the international collective for TIMSS, and adherence to this schedule is necessary to establish consistency in survey operations among participating countries as well as to maintain trend lines.

A.7 Special Circumstances

None of the special circumstances identified in the Instructions for Supporting Statement apply to the TIMSS study.

A.8 Consultations outside NCES

Consultations outside NCES have been extensive and will continue throughout the life of the project. The IEA studies are developed as a cooperative enterprise involving all participating countries. An International Steering Committee has general oversight of the study and each National Research Coordinator participates in extensive discussions concerning the projects, usually with advice from national subject matter and testing experts. In addition, the IEA convened separate panels of mathematics and science experts from around the world to develop cognitive items.

The majority of the consultations (outside NCES) have involved the TIMSS International Study Center at Boston College in the United States. Key to these ongoing consultations are: Hans Wagemaker (executive director of the IEA); Michael Martin, Ina V.S. Mullis, Victoria Centurino, and Alka Arora, all of whom have extensive experience in developing and operating international education surveys (especially related to TIMSS).

A.9 Payments or Gifts to Respondents

In order to achieve acceptable school response rates, schools have historically been offered compensation for the time they invest in and the space they make available for the international assessments. High response rates are required by both IEA and NCES, and are difficult to achieve in school-based studies. The U.S. has historically had difficulties in achieving sufficient participation levels. Based on incentives provided in past administrations of TIMSS and currently offered in international assessments, schools will be offered $200 for their time.

The school staff serving as School Coordinators will receive $100 for their time and effort. The School Coordinator serves a critical role in data collection, functioning as the central school contact and facilitating arrangements for the assessments. They are asked to file class and student listing forms; arrange the date, time and space for the assessment; and disseminate information to parents and students.

Consistent with prior administrations of TIMSS, as a token of appreciation for their participation, students will receive a small gift valued at approximately $2. In TIMSS 2011, each participating student received a small

watch/stop watch that could be clipped securely (with an attached karabiner) to a backpack or belt loop. The same product will be distributed to participating students for the TIMSS 2015 data collection. Students will also receive a certificate with their name thanking them for participating in and representing the United States in TIMSS 2015. Some schools also offer recognition parties with pizza or other treats for students who participate; however these are not reimbursed by NCES or the contractor.

High school students participating in the TIMSS Advanced study will receive a certificate from the U.S. Department of Education for four hours of volunteer service.

A.10 Assurance of Confidentiality

The laws pertaining to the collection and use of personally identifiable information are clearly communicated in correspondence with states, districts, schools, teachers, and students. Letters and information materials will be sent to parents and school administrators describing the study, its voluntary nature, and the extent to which respondents and their responses will be kept confidential (see copies in appendix B):

> *NCES is authorized to conduct this study under the Education Sciences Reform Act of 2002 (ESRA 2002), 20 U.S. Code, § 9543. By law, the data provided [by your schools, staff, and students] may only be used for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S. Code, § 9573).*

The following statement will appear on the front cover of the questionnaires (the phrase "*search existing data resources, gather the data needed*" will not be included on the student questionnaire):

> *U.S. participation in this study is sponsored by the National Center for Education Statistics (NCES), U.S. Department of Education. Your responses are protected by federal statute (20 U.S.C., § 9573). Your answers may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law.*
>
> According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this voluntary information collection is 1850-0695. The time required to complete this information collection is estimated to average XX minutes per response, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have any comments concerning the accuracy of the time estimate(s) or suggestions for improving the form, please write to: U.S. Department of Education, Washington, D.C. 20202-4537. If you have comments or concerns regarding the status of your individual submission of this form, write directly to: Trends in International Mathematics and Science Study (TIMSS), National Center for Education Statistics, U.S. Department of Education, 1990 K Street, N.W., Washington, D.C. 20006.
>
> OMB No. 1850-0695, Approval Expires xx/xx/2016.

The TIMSS 2015 confidentiality plan includes signing confidentiality agreements and notarized nondisclosure affidavits by all contractor and subcontractor personnel and field workers who will have access to individual identifiers. Also included in the plan is personnel training regarding the meaning of confidentiality, particularly as it relates to handling requests for information and providing assurance to respondents about the protection of their responses; controlled and protected access to computer files under the control of a single data base manager; built-in safeguards concerning status monitoring and receipt control systems; and a secured and operator-manned in-house computing facility. Data files, accompanying software, and documentation will be delivered to NCES at the end of the project. Neither names nor addresses will be included on any data file.

NCES understands the legal and ethical need to protect the privacy of the TIMSS respondents and has extensive experience in developing data files for release that meet the government's requirements to protect individually identifiable data from disclosure. The contractor will conduct a thorough disclosure analysis of the TIMSS 2015 data when preparing the data files for use by researchers, in compliance with 20 U.S.C., § 9573. Schools with high disclosure risk will be identified and, to ensure that individuals may not be identified from the data files, a variety of masking strategies will be used, including swapping data and omitting key identification variables (i.e., school

name and address) from both the public- and restricted-use files (though the restricted-use file will include an NCES school ID that can be linked to other NCES databases to identify a school); omitting key identification variables such as state or ZIP Code from the public-use file; and collapsing or developing categories for continuous variables to retain information for analytic purposes while preserving confidentiality in public-use files.

A.11 Sensitive Questions

None of the TIMSS questionnaires that the United States is administering—the student, school, and teacher questionnaires--have items considered to be of sensitive nature.

A.12 Estimates of Burden

This package shows estimated burden to respondents for all TIMSS 2015 activities, and requests approval for burden to respondents for the TIMSS Advanced field test, the TIMSS and TIMSS Advanced main study recruitment, and the TIMSS Advanced field test data collection portions of the total study burden. Burden estimates are shown in Table A.1. The time required for students to respond to the assessment (cognitive items) portion of the study, and associated directions, are shown in gray font and are not included in the totals because they are not subject to the PRA. Student, administrator, and teacher questionnaires are included in the requested burden totals. Recruitment and pre-assessment activities include the time to review study requirements in the districts that require approval before contacting the school, and the time involved in a school deciding to participate, completing teacher and student listing forms, distributing parent consent materials, and arranging assessment space.

Burden estimates for the main study are also provided for information purposes in table A.1. They are calculated based on the U.S. participating in TIMSS Advanced at grade 12. A computer-based pilot may also be implemented, but the scale is currently unknown. Preliminary burden estimates for the pilot are included based on an assumption of 25% of the main study schools participating in the pilot, at grades 4 and 8.

In 2011, two states provided their own funding to participate in TIMSS. There is growing interest in TIMSS at the state level and more states may choose to participate in 2015. The main study burden estimates reflect burden for the inclusion of up to 10 states and Puerto Rico The main study burden estimates will be updated following the field test as final design decisions are made.

For the TIMSS Advanced field test, the total student response burden of 1,163 hours from 1,395 students is based on a 50-minute background questionnaire. At $7.25 per hour (the 2009 Federal minimum wage) cost to students, the burden cost of the field test study for students is estimated at $8,432.

For the field test school administrator 30-minute questionnaire and all of the field test and main study recruitment and pre-assessment activities for the national, state, and Puerto Rico samples (as detailed below), burden cost is calculated at an estimated $50.00 per hour cost to school and district administrators (for 6,236 hours), and an estimated $35.00 per hour cost for school staff, coordinators, and teachers (for 14,416 hours), and the burden cost of the field test and main study recruitment and pre-assessment activities for 8,549 district and school staff is estimated at $816,360.

Table A.1. Burden estimates for TIMSS 2015 Field Test and Main Study (*continued on the next page*).

Data collection instrument	Sample size	Expected response rate	Number of respondents	Number of responses	Minutes Per respondent	Total burden Hours
Field Test: TIMSS Advanced						
Student Directions Advanced Math. & Physics	1,500	0.93	1,395	1,395	10	233
Student Assessment Advanced Math. & Physics	1,500	0.93	1,395	1,395	90	2,093
Student Questionnaire Advanced Mathematics & Physics (sample size 750 each)	**1,500**	**0.93**	**1,395**	**1,395**	**50**	**1,163**
School Administrators Questionnaire Advanced	**35**	**0.99**	**35**	**35**	**30**	**18**
Teachers Questionnaire Advanced	**140**	**0.97**	**136**	**136**	**30**	**68**
School Administrator Recruitment	**40**	**0.88**	**35**	**35**	**90**	**53**
School Staff Course Catalogue	**61**	**1.00**	**61**	**61**	**30**	**31**
School Coordinator Grade 12	**40**	**0.88**	**35**	**35**	**240**	**140**
Total Burden Field Test			***1,697***	***1,697***		***1,473***
Main Study-- Based on core + Advanced						
National sample						
Student Grades 4 & 8 Directions (sample size 5,650 each)	11,300	0.93	10,509	10,509	10	1,752
Student Assessment Grade 4	5,650	0.93	5,255	5,255	72	6,306
Student Assessment Grade 8	5,650	0.93	5,255	5,255	90	7,882
Student Grades 4 & 8 Questionnaire (sample size 5,650 each)	11,300	0.93	10,509	10,509	50	8,758
Student Computer-based Pilot Directions	2,825	0.93	2,627	2,627	10	438
Student Computer-based Assessment	2,825	0.93	2,627	2,627	90	3,941
Student Computer-based Pilot Questionnaire Grades 4 & 8	2,825	0.93	2,627	2,627	20	876
Student Directions Advanced Math. & Physics	8,550	0.93	7,952	7,952	10	1,325
Student Assessment Advanced Math. & Physics	8,550	0.93	7,952	7,952	90	11,928
Student Questionnaire Advanced Mathematics & Physics (sample size 8,550 each)	8,550	0.93	7,952	7,952	50	6,626
School Administrators Questionnaire Grade 4, 8, & Advanced	744	0.99	737	737	30	369
Teachers Questionnaire Grade 4, 8, & Advanced	2,975	0.97	2,886	2,886	30	1,443
School Administrator Recruitment	**850**	**0.88**	**748**	**748**	**90**	**1,122**
School Staff Course Catalogue	**375**	**1.00**	**375**	**375**	**30**	**188**
School Coordinator Grade 4	**300**	**0.88**	**264**	**264**	**1,140**	**5,016**
School Coordinator Grade 8 & 12	**550**	**0.88**	**484**	**484**	**240**	**1,936**
District IRB Staff Study Approval	**100**	**1.00**	**100**	**100**	**120**	**200**
District IRB Panel Study Approval	**600**	**1.00**	**600**	**600**	**60**	**600**

Table A.1. (*continued*). Burden estimates for TIMSS 2015 Field Test and Main Study.

Data collection instrument	Sample size	Expected response rate	Number of respondents	Number of responses	Minutes Per respondent	Total burden Hours
State benchmarking (up to 10 states & Puerto Rico)						
Student Grades 4 & 8 Directions (sample size 22,000 each)	44,000	0.93	40,920	40,920	10	6,820
Student Assessment Grade 4	22,000	0.93	20,460	20,460	72	24,552
Student Assessment Grade 8	22,000	0.93	20,460	20,460	90	30,690
Student Grades 4 & 8 Questionnaire (sample size 22,000 each)	44,000	0.93	40,920	40,920	50	34,100
Student Directions Advanced Math. & Physics	22,000	0.93	20,460	20,460	10	3,410
Student Assessment Advanced Math. & Physics	22,000	0.93	20,460	20,460	90	30,690
Student Questionnaire Advanced Mathematics & Physics (sample size 11,000 each)	22,000	0.93	20,460	20,460	50	17,050
School Administrators Questionnaire Grade 4, 8, & Advanced	1,650	0.99	1,634	1,634	30	817
Teachers Questionnaire Grade 4, 8, & Advanced	6,600	0.97	6,402	6,402	30	3,201
School Administrator Recruitment	**1,881**	**0.88**	**1,655**	**1,655**	**90**	**2,483**
School Staff Course Catalogue	**825**	**1.00**	**825**	**825**	**30**	**413**
School Coordinator Grade 4	**627**	**0.88**	**552**	**552**	**240**	**2,208**
School Coordinator Grade 8 & 12	**1,254**	**0.88**	**1,104**	**1,104**	**240**	**4,416**
District IRB Staff Study Approval	**220**	**1.00**	**220**	**220**	**120**	**440**
District IRB Panel Study Approval	**1,320**	**1.00**	**1,320**	**1320**	**60**	**1,320**
Total Burden District/School Recruitment and Pre-Assessment Activities Main Study			***8,247***	***8,247***		***20,342***
Total Burden Requested in this Submission			***9,944***	***9,944***		**21,815**

Note: OMB Clearance Requested: Total Burden includes burden associated with conducting the TIMSS 2015 Field Test and the recruitment and pre-assessment activities for the TIMSS 2015 Main Study (items in bold). The TIMSS 2015 Main Study burden is conservatively high because the TIMSS 2015 Main Study may include up to 10 benchmarking states and Puerto Rico; however the burden is held consistent with national sample schools because of potential variability between states. Total student burden does not include the time for the cognitive assessment and its associated instructions (in gray font).

The total response burden for schools in the field test and main study is based on the following:

- A 30-minute school questionnaire for school administrators in 35 field test (FT) schools;
- A 30-minute teacher questionnaire for 140 teachers in the field test;
- 90 minutes for school administrators during the recruitment process in 35 FT schools, 748 main study (MS) schools, and 1,655 state sample and Puerto Rico (SSPR) schools;
- An average of 30 minutes for school staff to provide high school course catalogues in 61 FT, 375 MS, and 825 SSPR schools; and
- An average of 4 hours for school coordinators to coordinate logistics with the data collection contractor; supply a list of eligible students and teachers for sampling; communicate with teachers, students, and parents about the study to encourage participation; assist the test administrator in ensuring the sampled students attend the testing sessions; and assist the test administrator in arranging make-up sessions as needed in 35 FT, 748 MS, and 1,655 SSPR schools (1/3 at each grade level).
- An average of 2 hours for 100 MS and 220 SSPR district IRB staff and 1 hour for 600 MS and 1,320 SSPR district IRB review panelists to review study materials, where required.

A.13 Total Annual Cost Burden

Other than the burden associated with completing these pre-assessment activities and questionnaires (estimated above in Section A.12), the study imposes no additional cost to respondents nor the imposition of any record-keeping requirement.

A.14 Annualized Cost to Federal Government

The total cost to the federal government for conducting TIMSS 2015 full scale study (grades 4 and 8 and TIMSS Advanced) is estimated to be $10,658,124 over a 5-year period. The cost of the TIMSS Advanced field test is estimated at $904,839. These figures include all direct and indirect costs, and are based on the national data collection contract, valued at $6,087,960 over five years, from February 2013 to January 2018, for the core activities at grades 4 and 8, and $3,770,164 for the TIMSS Advanced option.

A.15 Program Changes or Adjustments

This submission is a reinstatement of respondent burden hours (the last TIMSS was cleared with PIRLS 2011 under OMB# 1850-0645 v.7). With regards to content, there are several changes to TIMSS 2015 from the previous round of data collection:

- No federally funded state benchmarking
- The addition of TIMSS Advanced to assess advanced mathematics and physics achievement
- Possible administration of a computer-based pilot in the main study time period

This request is for field test data collection and recruitment for field test and main study.

A.16 Plans for Tabulation and Publication

The TIMSS field test is designed to provide a statistical review of the performance of items on the cognitive assessment and questionnaires in preparation for the main study data collection. It also will provide valuable experience in administering the parent questionnaire, as well as recruiting, identifying eligible schools and students, and administering TIMSS Advanced to a high achieving sample of twelfth graders.

Based on the data collected in the main study, the TIMSS International Study Center will prepare separate reports for mathematics and science at grades 4 and 8, for advanced mathematics at grade 12, and for physics at grade 12. These reports will be released in December 2016. As has been customary, NCES will also release a report for each study at the same time as the international reports are released, interpreting the results for the U.S. audience. NCES reports on initial data releases are generally limited to simple bivariate statistics. There are currently no plans to conduct complex statistical analyses of either dataset. Examples of past reports on TIMSS can be found at http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2013009. In the spring of 2017, the International Study Center will also prepare technical reports for both TIMSS 2015 and TIMSS Advanced, describing the design and development of the assessments as well as the scaling procedures, weighting procedures, missing value imputation, and analyses. After the release of the international data, NCES plans to release the national data and an accompanying User's Guide for each study.

Electronic versions of each publication are made available on the NCES website. Schedules for tabulation and publication of TIMSS 2015 and TIMSS Advanced results in the United States are dependent upon receiving data files from the international sponsoring organization. With this in mind, the expected data collection dates and a tentative reporting schedule are as follows:

Dates	Activity
April—December 2013	Prepare data collection manuals, forms, assessment materials, questionnaires for field test
November 2013—February 2014	Contact and gain cooperation of states, districts, and schools for field test

February 2014—March 2014	Select student samples
March 2014—April 2014	Collect field test data
May 15, 2014	Deliver raw data to international sponsoring organization
July 2014—August 2014	Review field test results
May 2014—December 2014	Prepare for the main study/recruit schools
March 2015—May 2015	Collect main study data
June 2016	Receive final data files from international sponsors
June 2016—December 2016	Produce reports

A.17 Display OMB Expiration Date

The OMB expiration date will be displayed on all data collection materials.

A.18 Exceptions to Certification Statement

No exceptions to the certifications are requested.