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Title Slide: Getting Started with NAEP Data

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This module introduces users to the resources available to facilitate understanding and analysis of National Assessment of Educational Progress (NAEP) data. The module describes the resources available on the Nation's Report Card website and the National Center for Education Statistics (NCES) NAEP homepage. In addition, this module will introduce users to the NAEP Data Tools and describe how to access Restricted-Use NAEP Data Files.

Information presented in this module will be helpful in understanding some of the more detailed information presented in subsequent modules. For this reason, users who are planning to proceed through the subsequent NAEP modules and use the data for analytic purposes are strongly encouraged to complete this module first.

Throughout this module, underlined blue screen text indicates a link to additional resources.

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Nationsreportcard.gov, the official site for results from the NAEP, informs the public about the academic achievement of elementary and secondary students in the United States. Report cards communicate the findings of the National Assessment of Educational Progress (NAEP), a continuing and nationally representative measure of achievement in various subjects over time.

In addition to showcasing the newest NAEP reports, this website provides reports across all NAEP subject areas, information for educators, media, parents, policymakers, researchers, and students, as well as many other resources such as data tools, Frequently Asked Questions (FAQ), glossary, and contacts.

The Nation's Report Card is the best resource for accessing NAEP reports.

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Reports for each NAEP subject area can be accessed by clicking the subject areas listed to the left of the Nation's Report Card homepage. By clicking **Mathematics** you will be taken to a new page describing the **Top Stories in NAEP Mathematics 2013**. Links are provided throughout the page to access additional information.

These report pages facilitate a high-level understanding of what students know and can do across each of the NAEP subject areas. For example, here we see that at grades 4 and 8, average mathematics scores in 2013 were one point higher than in 2011, and 28 or 22 points higher respectively in comparison to 1990, the first assessment year.

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Information for educators, media, parents, policymakers, researchers, and students can be accessed by clicking the audiences listed to the left of the Nation's Report Card homepage. By clicking **Researchers**, you will be taken to a new page describing resources that provide researchers more information about NAEP. Here you can see four resources (build custom tables, technical documentation, research support, and NAEP e-Library) that will help facilitate your understanding of NAEP.

Each of the pages providing information will differ by audience and will reference materials on the Nation's Report Card website, as well as the NCES website.

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Many other resources such as data tools, Frequently Asked Questions (FAQ), glossary, contacts, and information about the Nation's Report Card can be accessed by clicking any of the **Resources** listed to the left of the Nation's Report Card homepage. By clicking **Data Tools**, you will be taken to a new page describing seven tools that facilitate understanding of NAEP data. Clicking the **Data Explorer** will take you to a tool that allows you analyze NAEP data and create tables and graphics. The NAEP Data Explorer (NDE) will be described in full later in this module. Clicking the **District Profiles** will allow you to explore the results of the NAEP Trial Urban District Assessments (TUDA). Clicking the **Item Maps** will allow you to see what students at each achievement level are likely to know and can do. The **Questions Tool** will allow you to search, sort, and print sample NAEP questions. The **State Comparisons Tool** will allow you to compare state performance by various demographic groups. The **State Profiles Tool** will allow you to see NAEP performance results and student demographics for each state. Finally, the **Test Yourself Tool** allows you to answer actual questions administered to students in the NAEP assessment.

All of the resources provided on this page will help facilitate your understanding of NAEP data and should be reviewed prior to conducting any analyses.

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The NCES NAEP homepage provides additional resources to help you get started with NAEP data. The NCES site provides detailed information regarding the NAEP assessments, NAEP Special Studies, publications and products, staff, data tools, as well as email-based NAEP-specific NewsFlash and contact information.

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Clicking **Data Tools** from the NCES NAEP homepage will bring you to this page, the NAEP Data Explorer, or NDE. The NDE is one of five tools provided on the NCES NAEP website. All five of these tools are also accessible via the Nation's Report Card website under **Resources** and have been discussed earlier in this module. It is important to note that State Comparisons, State Profiles and District Profiles are named

the same thing across both websites. To access the NDE via the NCES NAEP website, click **Analyze Data**, or simply click **Data Tools** from the NCES NAEP home page; or on the Nation's Report Card website the NDE can be accessed by clicking **Data Explorer**. Clicking **Sample Questions** on the NCES NAEP website, and **Questions Tool** on the Nation's Report Card website will take you to the same data tool. Two data tools, **Item Maps** and **Test Yourself** are accessible via the Nation's Report Card website

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The Data Explorer for Main NAEP (MAIN NDE), provides national and state results in ten subject areas, including mathematics, reading, writing, and science. Results have been produced for the nation and participating states and other jurisdictions since 1990, and for selected urban districts on a trial basis since 2002.

In addition to the materials presented within this module, a tutorial and quick reference guide are available from the NDE homepage. Additionally, analysts can use the NDE help button, which is available at the top of every page within the NDE.

Now, let's take a closer look at the MAIN NDE.

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From the NDE homepage, click **MAIN NDE** and agree to the terms detailed within the pop up window.

The first step in exploring MAIN data is to select criteria from each drop-down menu, a subject and a grade. In the examples shown here, we have selected **civics** and **Grade 4**.

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Once the subject and grade level are selected, additional option menus open, like the one you see here. You can select a **Jurisdiction** from the Group section of the NDE; the example selected here is **National** but you can also select (or deselect) any of the other options that appear. Once you have selected all your analysis criteria, click **2. Select Variables** to advance to the next screen.

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From the **Select Variables** tab, you will see MAIN NDE variables for analysis nested within Categories and Sub Categories. It is important to note that the first Category and Sub Category – Major Reporting Groups, Student Factors – can be expanded. A scroll bar to the right of the MAIN NDE window will allow you to scroll down to additional Categories of interest. You can also click the downward facing arrows to the left of each Category and Sub Category to collapse the lists for easier navigation.

Here you can see that the Variable option has been expanded to show all options, and the **All students** and **Gender** variables have been selected.

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Clicking **3. Edit Reports** at the bottom of the **Select Variables** tab will bring you to the **Edit Reports** tab. From this page you will be able to preview, edit, delete, or copy the reports specified in the previous steps. Next, click **4. Build Reports** at the bottom of the NDE page.

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From the **Build Reports** tab, you will be able to view the results from each specified report by selecting the report name from the **Select Reports** drop-down menu. The default display of results is tabular. If you'd like to generate a chart, click **Chart**. Here we see that the average Civics score for Grade 4 was 157 in 2010.

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From the **Build Reports** tab, you can select **Report 2** from the Select Reports drop-down menu to view the other specified report. Again, the default display of results is tabular. Here we see that in 2010, the average Grade 4 Civics score for males was 153 and the average score for females was 160.

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To conduct a test of significance for civics scores among Grade 4 students by gender, click **Significance Test** and select variables of interest. Here we have selected **gender, male,** and **female**. Once you have selected variables, click **Done** in the lower right hand corner to proceed.

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Results of the significance test will be displayed on the next page. Here we see that the average scale score of females in 2010 was greater than that of males.

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Sample NAEP questions can be explored in a variety of ways using the NAEP website. After each assessment, NAEP releases dozens of sample questions to the public. The four tools featured here can be used to explore a database of released NAEP questions, explore questions from computer-based assessments, try out actual NAEP questions administered to students, and see what students at each achievement level are likely to know and be able to do.

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The NAEP Questions Tool, or NQT, is a database of more than 3,000 questions, in nine subject areas, from past assessments that have been released to the public. These questions will not be used again on future NAEP assessments. The NQT allows you to search for questions by subject, grade, difficulty, and other characteristics, as well as view sample student responses and information about how they were scored. You can also view performance data, making the NQT a valuable tool in comparing student performance on questions across the nation.

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Here we see three Grade 4 Interactive Computer Tasks. Clicking any one of these tasks allows you to take the entire task or see the correct answers and the performance data for each question.

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From this screen, click on any subject and a series of sample questions will appear. After answering all the questions, you will be able to compare your score with that of students nationally.

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To see what students at each achievement level are likely to know and be able to do, click **Item Maps.** Selected item descriptions are mapped to NAEP scales for selected subjects, years, and grades. Here you can see the item map for **Mathematics**, **Grade 4**, from the 2013 NAEP assessment. Students who perform between the scale scores of 320 and 330 are likely to be able to compute with time and describe a numerical pattern in context. You will see that some of the item descriptions, like **Use ratio to describe situation in context** are hyperlinked to show you the question detail in the NQT.

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State Comparisons provides tables and maps that compare states and jurisdictions based on the average scale scores for selected groups of public school students within a single assessment year, or compare the change in performance between two assessment years. To conduct state comparisons using this tool, follow the steps to select a grade, subject, and student group. The **State Comparisons Overview link** within the tool provides more information regarding the use of State Comparisons.

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State Profiles presents key data about each state's performance in the National Assessment of Educational Progress (NAEP) in mathematics, reading, writing, and science for students in grades 4 and 8.

By selecting a state, you can see demographics and performance over time, download snapshot reports, and compare each state's overall performance to the nation and each other.

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District Profiles present results from the NAEP Trial Urban District Assessment (TUDA) that makes it possible to compare the performance of students in urban districts to public school students in large cities (such as, cities with populations of 250,000 or more). Results include mathematics, reading, writing, and science for grades 4 and 8. These profiles allow you to see district performance over time, download snapshot reports, and compare each district's overall performance to the Large City jurisdiction and each other.

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As you can see, a wealth of resources exist on the Nation's Report Card and NCES NAEP websites that can help you address questions about what the nation's students know and can do. They range from reports that present results from NAEP, to data tools that allow you to create statistical tables, charts, and maps to help you find answers to your questions. In some cases, these resources alone may not address your specific research question. Some analyses may require the use of restricted-use NAEP data files. The NAEP restricted-use data files available for analysis are listed under **Data Products** on the NCES NAEP website. The slides that follow will provide important information for analysts who seek and obtain NAEP restricted-use data files.

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Before receiving NAEP restricted-use data, analysts can work with the NAEP Primer, and the accompanying publically accessible dataset. Working with the NAEP Primer will acquaint analysts with the NAEP primer mini-sample, the NAEP database, NAEP data tools, analyzing NAEP data, marginal estimation of score distributions (plausible values), direct estimation using AM Software, and fitting of Hierarchical Linear Models (HLM).

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The restricted-use NAEP data disk contains a variety of files that will help you get started with the data. The README text file contains a description of the disk contents.

The disk is partitioned into directories that contain specific types of files to facilitate analysis of NAEP data. The **DATA** directory contains respondent data in fixed-length ASCII text files. The **CODEBOOK** directory contains the file record layout and data codebook in PDF format files. The **SAS, SPSS, STATA,** and **AM** directories contain syntax files for converting data files into corresponding statistical software system files. The **CATALOG** directory contains data field descriptions for other procedural languages. The **COMPANION** directory contains a PDF document with information and

guidelines on use of data, and important technical documentation. The **NAEPEX and SELECT** directory contains proprietary files used by NAEPEX programs. NAEPEX, which we will discuss in a moment, is the data extraction program for choosing variables, extracting data, and generating AM, SAS, SPSS, and Stata files necessary for analysis of NAEP data.

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Across all NAEP data files, a standard eight-character file naming convention is used. The first character indicates the subject, the second and third characters indicate the NAEP year, the fourth character indicates the component, the fifth character indicates the type of data, the sixth character indicates the grade level, and the seventh and eighth characters indicate the sample.

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The first character in the eight-character file naming convention indicates the subject, where A indicates the arts; C, civics; E, economics; G, geography; M, mathematics; R, reading; S, science; H, history; and W indicates writing.

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The second and third characters in the eight-character file naming convention indicate the NAEP year. As NAEP was first conducted in 1969, NAEP Year 1 always indicates 1969. To calculate the NAEP year, subtract 1969 from the calendar year of interest. For example, the NAEP Year associated with 2009 is 40, 2009 minus 1969 equals 40.

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The fourth character in the eight-character file naming convention indicates the NAEP component, either National (N), or State (S). It is important to note that TUDA data are a part of the State file.

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The fifth character in the eight-character file naming convention indicates the type of data, either student (S), or school (C).

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The sixth character in the eight-character file naming convention indicates the grade level. Grade levels in NAEP are identified by cohort, where cohort 1 represents students in grade 4 or 9-year-olds; cohort 2 represents students in grade 8 or 13-year-olds; and cohort 3 represents grade 12 or 17-year olds.

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The seventh and eighth characters in the eight-character file naming convention indicate the sample for which the data are representative. Data files containing MAIN NAEP data will end with the letters, 'AT,' data files containing Long Term Trend NAEP data will end with the letters, 'LT,' and data files containing NAEP data from the Indian education sample will end with the letters, 'IE.'

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Here are two examples of the NAEP standard eight-character file naming convention in action. The first file, **R40NT1IE** contains data from the NAEP reading assessment administered in 2009. The file contains national student-level data for 4th graders in the Indian education survey sample.

The second file, **R36NT1AT**, also contains data from the NAEP reading assessment. This file contains the 2005 national student-level data for 4th graders in the main NAEP sample.

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All NAEP data files share common structure and contents. Each student file contains unit record data where student is the unit of analysis. Each student record contains identification information and sample indicators, weights (both population- and sample-based), reporting categories and derived variables, ability estimates (or plausible values), student background questionnaire responses, student cognitive item responses/scores, Students with Disabilities/English Language Learners (SD/ELL) questionnaire responses, and teacher questionnaire responses.

Each school file contains school questionnaire responses and school-level sample weights.

There is also a student and school file that contains all the student file data with the school file data concatenated for analysts. It is important to note that the student file does contain the school ID, which can be used to match records from the school file, if desired.

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NAEPEX is the data extraction program for choosing variables, extracting data, and generating the statistical system files necessary for the analysis of NAEP data in AM, SAS, SPSS, and Stata. The NAEPEX is part of the NAEP Data Toolkit which can be accessed directly from the NAEP restricted-use CD-ROM. NAEPEX is NAEP's Electronic Code Book (ECB). It will take you through the process of selecting variables and producing syntax/script to generate NAEP data files for your specific analyses.

The NAEPEX will be described in more detail within the module titled, **Considerations for the Analysis of NAEP Data**.

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The NAEPEX creates a system file, in either AM, SAS, SPSS, and Stata, that contains all cases and variables specified for your specific analyses. The syntax/script contains file definition (file name and attributes), file data definition (data file names, positions, and formats), variable attributes (variable labels and formats), value labels (SPSS data value descriptors, SAS Proc Format, and STATA labeldef), missing values (optional code specifying data values to be treated as missing), and scoring (optional code for converting cognitive item responses to scored values appropriate for IRT scaling).

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This module introduced users to the resources available to facilitate understanding and analysis of National Assessment of Educational Progress (NAEP) data. The module described the resources available on the Nation's Report Card website and the National Center for Education Statistics (NCES) NAEP homepage. In addition, this module introduced users to the NAEP Data Tools and described how to access Restricted-Use NAEP Data Files.

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Important resources that have been provided throughout the module are summarized in this slide for your reference.

You may now proceed to the next module in the series, or click the **Exit** button to return to the landing page.