Part 4

Tools & Resources

I. Tools List

Generate Questions to Study Student Needs
a. Sample Questions to Ask of Data

This activity is designed to help participants begin to identify and form important questions regarding student achievement. The emphasis is on forming meaningful and measurable questions. The sample questions are provided as a starting place for conversations. Aligned with the sample questions are suggested places to find the information and suggested methods to employ to answer each question. Participants should begin by reading the sample questions and then generate their own questions regarding the area of student achievement that is of interest.

The QIC-Decide tool from Data Driven Leadership (DDL) guides a process to assist educators in forming questions and using data to make decisions. QIC-Decide may assist districts in using data to address many of the questions suggested in these materials. Tool 2(data)3 has suggestions for where to find answers to these questions.

District

1. How does our student performance in reading and math compare with state and national achievement norms?
2. Are our mean percentile math and reading achievement scores consistent at the elementary, middle school and high school levels?
3. How does the achievement of our various subgroups (e.g., Special Education, English Language Learners, economically disadvantaged[1], ethnic groups, etc.) compare with our district averages in reading and math? Are we serving all students equally?
4. How many schools do we have "in need of improvement" or in danger of being labeled "Continuous Improvement Priority School (CIPS)?"
5. How do our reading and math scores correlate with attendance?
6. How do our reading and math scores correlate with discipline referrals?
7. How many of our students are proficient in reading? Math?
8. How many of our students are "marginally" proficient (e.g., just making proficient in the MEA /MHSA?)

School

[Schools will ask many of the same questions of their school data that the district asks about all their students. In addition, schools have other questions that are specific to their sites.]

9. What areas of reading/math are most difficult for our students (e.g., item analyses of MEA /MHSA data will reveal scores for sub-categories of reading such as "decoding", "using context clues", and "determining main ideas")? What are the strongest skill areas for our students in reading and math? What are the weakest areas?
10. Do we have overlap among our sub-groups (e.g., how many of our special education students receive free/reduced lunch or how many of our economically disadvantaged students belong to ethnic groups)?
11. When we look at the distribution of reading scores for students in special education, are there clusters of high and low achievement by type of disability?
12. What are the reading scores of students who have dropped out of school this year?
13. What is the correlation of reading scores with students who have been referred to the office for discipline problems this year?
14. How much independent reading do our students do? At school? At home?
15. What supports for struggling students are present in our school, neighborhood, and community? Do we know how effective they are?
16. Why are our students referred to the office? What are the most common forms of student misbehavior in our school?

Department/Grade Level(s)

17. What specific comprehension tasks account for the 4th and 5th grade decline in overall comprehension scores on the MEA ?

[1] We refer to low socio economic as economically disadvantaged. We use the term "group" and not minorities when discussing the ethnic groups.

18. How many of the 9th grade students reading below the 40th percentile on the MHSA are earning D's or F's in English I?
19. When we examine the item analysis data for math on the MEA, are the strengths or weaknesses discovered consistent across all the grades?
20. How many of our students failed Algebra I? How many failed English I?

b. The QIC Decide Tool

The Maine Professional Development Model and QIC-Decide

The implementation of the Maine Professional Development Model requires careful use of data throughout the process. The design of the model incorporates an action research process that includes multiple steps where data are collected, organized and analyzed to make decisions about professional development and school improvement. The QIC-Decide tool guides a process to assist educators in forming questions and using data to make decisions. QIC-Decide may be used to facilitate the action research approach that serves as the framework for the Maine Professional Development Model. The four steps in QIC-Decide are:

- Question
- Information
- Collect
- Decide

Administrators and other practitioners familiar the QIC-Decide process may determine that QIC-Decide expedites their work in implementing the action research cycle outlined in the Maine Professional Development Model. Examples of questions that might arise in the various steps of the Maine Professional Development Model are listed below. Many of these questions will generate additional questions that can be addressed using the QIC-Decide process.

1. What does the data tell us about how all students in our district/building are performing in reading? … math? …science? How is each subgroup in our district performing in reading? … math? …science? What implications do these results have for instructional practice? For staff development? What additional student performance data do we need to determine a focus for professional development?

2. What focus area in curriculum and instruction has the greatest urgency for our students and their families?

3. Which scientifically research-based strategy is likely to close achievement gaps identified through the process? Is this strategy replicable in our district/building?

4. How will we know when implementation of the planned strategy has occurred? Is each teacher in our district/building implementing the strategy with fidelity? How many children in our district have experienced accurate application of the strategy in the classroom on a consistent basis? How will the district address schools and classes where implementation is lagging?

5. Is adequate time allotted for staff development to enable teachers to plan and discuss lessons?

6. How frequently are students experiencing the content of staff development?

7. What do the trend lines in student performance data suggest about the effectiveness of the staff development initiative?

Tool 2(data).1. Generate Questions to Study Student Needs: (page 3 of 6)

QIC-DECIDE Standards and Benchmarks

Question

Standard 1: Identifies and forms important questions that define a specific problem.
Benchmarks:

1.1 Identify questions that will lead to improved programs, services, and results for children and youth.
1.2 Forms assessment questions in a way that they can be answered with data.

Information

Standard 2: Identifies the information needed to answer the question.
Benchmarks:

2.1 Determine the type and quality of the information needed based on the nature of the decision.
2.2 Identify the quantity of information based on the nature of the decision.

Collection

Standard 3: Collects and effectively organizes information.
Benchmarks:

3.1 Use efficient and effective data gathering strategies
3.2 Organize and analyze the information appropriately.

Decide

Standard 4: Uses information to make important educational decisions.
Benchmarks:

4.1 Appropriately interprets the information to draw conclusions that are meaningful to educational practice.
4.2 Uses the collected data to document and justify the decision, taking into account the possible limitations of the data.

The following page shows a brief example of one school's application of the QIC-Decide tool.

Tool 2(data).1. Generate Questions to Study Student Needs: (page 4 of 6)

Question **– Identifies and forms important questions that can be answered with data that define a specific problem and that lead to improved programs, services, and student achievement**

Area: grade six reading

Who to involve: classroom teachers, Title teacher, special education teachers, curriculum director, principal

Expectations: all students at the proficiency level

Question: How are our sixth graders achieving in reading?

Information **– Identifies information necessary to answer the question by determining the type, quality, and quantity of information**

Consequences: high

Amount/type of data needed: one source of data that is technically adequate, highly objective, and direct in measure; at least one source of supporting data that is as technically adequate, highly objective, and direct in measure as possible

Information to collect: 3RD -5th grade MEA and multiple measure scores in reading, attendance data, when started school, intervention data (Special Ed, Title, etc.), tardy, ELL, Free and reduced lunch data(SES)

Collect **– Collects and effectively organizes information using efficient data collection strategies; analyzes information appropriately**

Plan: yes

Organize: raw data tables of non proficient students

Summarize: number of students by subgroups

Display: line graphs indicating four years of collected data

Decide **– Directly answers the question using collected information, with appropriate interpretation of information in order to make documented and justified conclusions**

Interpret: 21not 41NPR (16%), 10/21 SE (48%), 14/21 Boys (67%), 13/21 FR (62%), 0/21 are ELL. 8/21 Never Proficient (38%)

Decision statement and Justification: How are our sixth graders achieving in reading? The decision is that 21 of 132 sixth grade students are not reading at the proficient level. We are confident in this decision because of the amount and types of data used to make the decision

Communication: communication to the following groups: teaching staff, administrative team, school board, parents

Next steps: further analysis of multiple data sources, for those who have a skill deficit, determine teaching strategies to address deficiencies.

Tool 2(data).1. Generate Questions to Study Student Needs: (page 5 of 6)

Question
Area: **Who to involve**: **Expectations**: **Question to answer:**
Information
Consequences are: **Amount/type of data needed**: **Information we will collect**:
Collect
Plan: **Organize**: **Summarize**: **Display**:
Decide
Interpret: **Decision statement** **Justification**: **Communication**: **Next steps**:

Tool 2(data).1. Generate Questions to Study Student Needs: (page 6 of 6)

c. What We Need to Know About Our Students

As the team members generate questions to address the topic, "What we need to know about our students," they record each question on the form below. After the data have been collected, analyzed, and interpreted, team members record their answers.

QUESTION NUMBER	QUESTION	ANSWER

Tool 2(data).2. Where to Find Answers to our Questions (page 1 of 2)

Where to Find Answers to Our Questions

Now that you have generated questions about your data, consider the best places to get information to answer each question. Assessment data to answer many of the questions are probably readily available. But also consider other information you might need to collect, such as student attendance or the time students spend in reading instruction. After examining various data sources for answers to your questions, construct your own matrix of information sources. The key is to look for evidence from multiple sources of information. First, examine the sample in the table below. Then use the blank table to consider data for your own school.

	DISTRICT	SCHOOL
Data on Computer (MEA UNTIL TRANSITION TO NECAP; MHSA; PSAT) and demographic data)	1, 2, 3, 4, 7, 8	10, 11, 12, 13, 17
Data on Hard Copy (item analysis for system and building)		9, 19
Other data (specify) Attendance data added to computer data by student	5	
Other data (specify) Number of office referrals for discipline by student)	6	
Sort office referrals for discipline by type		16
Data on amount of independent work done by students		14
School and community programs before and after school for homework assistance, tutoring, etc.		15
Grade distribution data		18, 20

Tool 2(data).2. Where to Find Answers to our Questions (page 2 of 2)

On the form below, consider the sample questions **you** generated and determine where you will find the information to answer each question. Use the numbers corresponding to the questions from Tool 2(data).1c, "What We Need to Know about Our Students."

	DISTRICT	SCHOOL
Data on Computer (MEA and demographic data)		
Data on Hard Copy (item analysis for system and building)		
Other Data (specify)		

Tool 2(data).3. How to Find Answers for the Sample Questions (page 1 of 2)

How to Find Answers for the Sample Questions

Knowing what questions to ask is the first step. Knowing where to find the answers is the next. Different questions require that the data be examined in different ways. The following discussion examines each of our sample questions and suggests one method to examine the data to answer the question. Often there are multiple ways that the data can be examined to answer each question.

District

1. How does our student performance in reading and math compare with state and national achievement norms?
   MEA, SAT, and NWEA both have national and state achievement norms. Other assessments, TeraNova for example, have national norms. Examine the state and national percentile ranks.

2. Are our mean percentile math and reading achievement scores consistent at the elementary, middle school and high school levels?
   Again the MEA /MHSA percentile ranks will give you this information. CAUTION: it is not good statistical practice to find the mean of percentile ranks because they are not equal interval data. You must average the standard scores and then use a conversion table to find the appropriate percentile rank. EXCEL calculates mean, mode, standard deviation, and range quickly using the "descriptive statistics" function.

3. How does the achievement of our various subgroups (e.g., Special Education, English Language Learners, economically disadvantaged, ethnic groups, etc.) compare with our district averages in reading and math? Are we serving all students equally?
   MEA /MHSA assessments for which students receive scores are disaggregated

4. How many schools do we have "in need of improvement" or in danger of being labeled "Continuous Improvement Priority School (CIPS)?"
   All school must test at least 95% of their students participate in MEA /MHSA testing.
   The percent of students who have attended for a full academic year (FAY) and score proficient on MEA in Reading Comprehension and Math Total must be above the state Annual measurable objective. A 95% one sided confidence interval and safe harbor may also be taken into account.

5. How do our reading and math scores correlate with attendance?
   Again MEA /MHSA scores or another measure such as a criterion referenced test (CRT) may be used. The Excel Data Analysis Tool called "correlation" will calculate the correlations.

6. How do our reading and math scores correlate with discipline referrals?
   See #5.

7. How many of our students are proficient in reading? Math?
   First you must determine what is meant by proficient. This is designated within your school assessment data report.

8. How many of our students are "marginally" proficient (e.g., scoring just above the proficient level in reading and math on the MEA /MHSA?)
   See #7. An EXCEL scatter plot can also help to visualize just where your students are scoring.

School

[Schools will ask many of the same questions of their school data that the district asks about all their students. In addition, schools have other questions that are specific to their sites.]

9. What areas of reading/math are most difficult for our students? (E.g., item analyses of MEA/MHSA data will reveal scores for sub-categories of reading such as "decoding", "using context clues", "determining main ideas", etc.)? What are the strongest skill areas for our students in reading and math? What are the weakest areas?
   Again examination of MEA /MHSA as well as multiple measures will help make the picture clear. You may want to look at the Group Item Analysis, Class Skill Performance Profile, and/or Class Item Response

Tool 2(data).3. How to Find Answers for the Sample Questions (page 2 of 2)

Record. The Group Item Analysis has a visual graph that allows you to quickly note what skills or items your students struggled with compared with either the state or nation.

10. Do we have overlap among our sub-groups? (For example, how many of our special education students receive free/reduced lunch? How many of our low SES students belong to ethnic minorities? Etc.)
    This is demographic information. The EXCEL pivot table can help you organize your data.

11. As a sub-group, our Special Education students scored 20 percentile points lower on the reading portion of the MEA than the rest of our student population. When we look at the distribution of reading scores for students in special education, are there clusters of high and low achievement by type of disability?
    EXCEL can help you compute frequency distributions for each disability type.

12. What are the reading scores of students who have dropped out of school this year?
    "Students who have dropped out" is binomial data, that is, either that student stayed in school (value =1) or dropped out (value = 0). Better question might be: how does the distribution of reading scores for students who dropped out compare to those that stayed in school? MHSA or another measure could be appropriate. Again, EXCEL can help you compute frequency distributions.

13. What is the correlation of reading scores with students who have been referred to the office for discipline problems this year?
    What you would probably correlate is the score on the assessment with the number of office referrals. EXCEL correlation can then calculate the appropriate statistic.

14. How much independent reading do our students do? At school? At home?
    A survey will be needed, but who is it best to ask? Students or parents? After you accumulate the data you may want to calculate descriptive statistics and frequency tables utilizing EXCEL.

15. What supports for struggling students are present in our school, neighborhood, and community? Do we know how effective they are?
    Different data collection strategies might be appropriate here to measure implementation and student data. The study design could vary dependent upon the support and whether or not "level" of support is to be measured. An ANOVA or regression might be the answer. EXCEL can do both of these functions.

16. Why are our students referred to the office? What are the most common forms of student misbehavior in our school?
    Frequency distributions could help answer this question. The answers may differ by classroom and/or grade level as well as by other subgroups.

Department/Grade Level(s)

17. What specific comprehension tasks account for the 4th and 5th grade decline in overall comprehension scores on the MEA?
    See question #9.

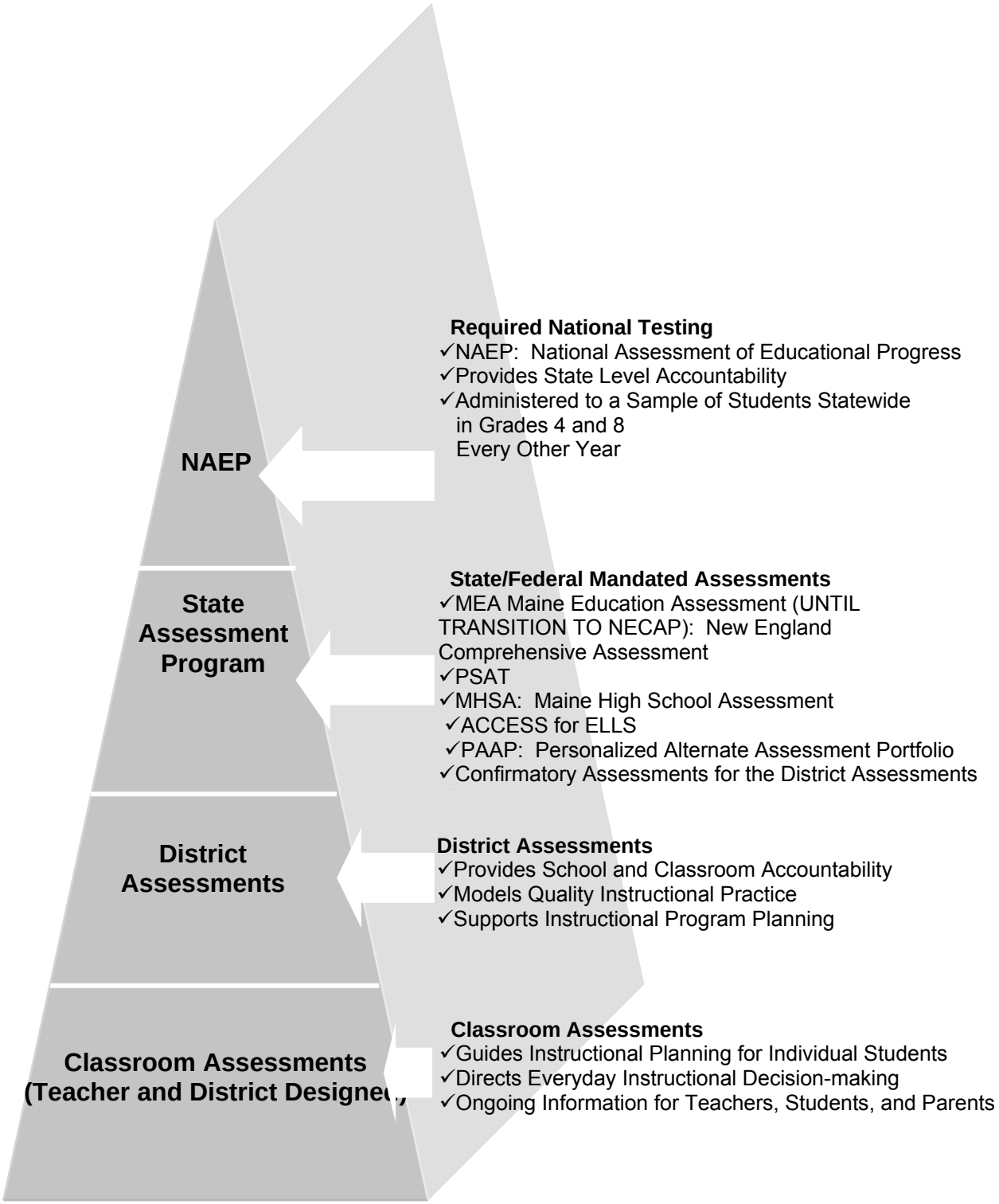
18. How many of the 9th grade students reading below the 40th percentile on the MEA or NWEA are earning D's or F's in English I?
    Construct a frequency table using all grades earned in English I using the students who scored below the 41st percentile.

19. When we examine the item analysis data for math on the MEA /MHSA, are the weaknesses discovered in problem solving consistent across all the grades?
    See question #9.

20. How many of our students failed Algebra I? How many failed English I?
    Construct a frequency table using all grades earned in Algebra 1 and/or English I. Note the median grade.

Tool 2(data).4. Maine Public Schools: Comprehensive Student Assessment System (1 page)

Maine Comprehensive Student Assessment System



Notes

Tool 2(data).5. Organize and Analyze Data (page 1 of 3)

Organize and Analyze Data

Four suggested ways to begin your examination of data follow. The methods listed here are designed to encourage you to consider different ways to look at data. Possible questions are also noted. All of the following computations and representations following are easily accomplished with paper and pencil. However, use of a computer program such as EXCEL may make calculations less tedious. Discuss each method of examining data and the reasons for using each.

Four ways to analyze data are discussed in the next three pages:

- ❑ Descriptive Statistics
- ❑ Disaggregate
- ❑ Longitudinal
- ❑ Cross-tabulation

Descriptive Statistics

Descriptive statistics answer questions about a set of data, such as:

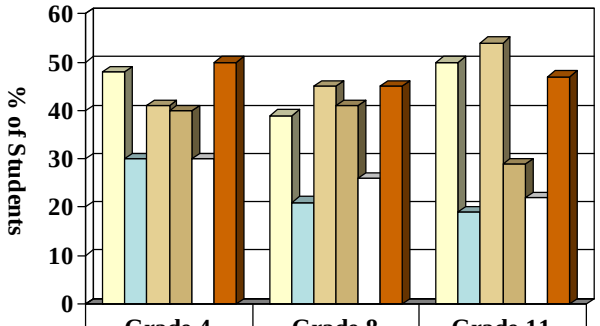
1. What is the mean (average) score?
2. What is the median score?
3. What is the mode?
4. What percent scored in the proficient range?
5. What was the highest score?
6. What was the lowest score?

Disaggregated: Example of disaggregated data:

MEA Performance Analysis

Reading Performance by Ethnic Group

Shows the Percent of Students in the Meets or Exceeds Performance Levels in 2002-03*



	Grade 4	Grade 8	Grade 11
Multi-Ethnic	48	39	50
Native American	30	21	19
Asian	41	45	54
Hispanic	40	41	29
Black	30	26	22
White	50	45	47

***Caution: Performance Analysis Reflects Variability Due to Small Populations**

Tool 2(data).5. Basic Ways to Analyze Data (page 2 of 3)

Longitudinal

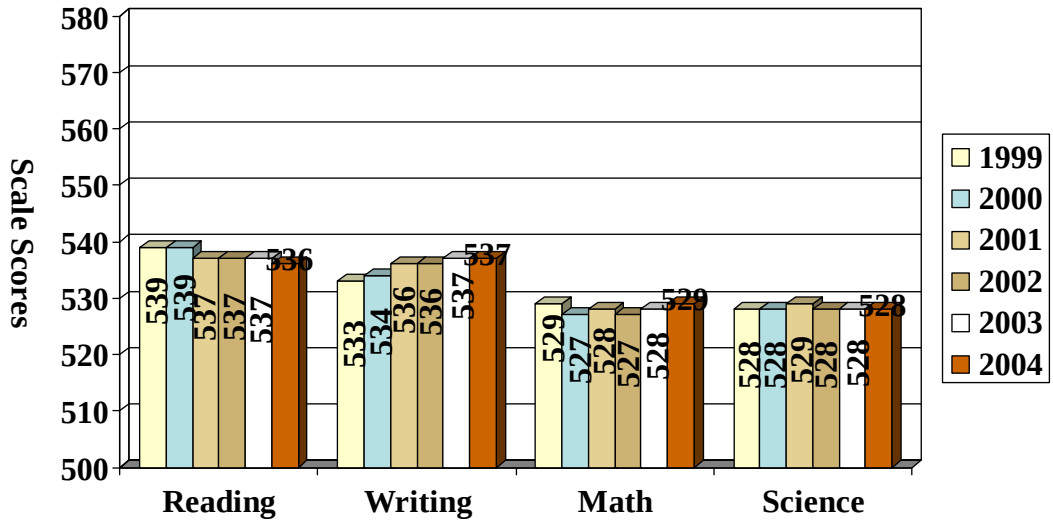
Longitudinal analysis answers the question "How are we doing over time?" Analysis may be by **cohort**, focusing on data over time for the *same* students; e.g., a selected group of students each year of testing. Or analysis may be **cross-sectional**, comparing results over time for *different* students who fit a specified description; e.g., all fourth graders for ten years.

Cross-sectional. This example addresses the question, "Are students in fourth grade doing as well as past fourth grade students?" Caution must be taken with this method to assure that any changes are real changes and not just a product of preexisting differences between groups.

Example of longitudinal data by cross-section:

MEA Scale Score Trends 1999 – 2003

Intermediate School – Grade Eight



Tool 2(data).5. Basic Ways to Analyze Data (page 3 of 3)

Cross-tabulate

Do the groups interact on certain characteristics?

A simple template for cross tabulations:

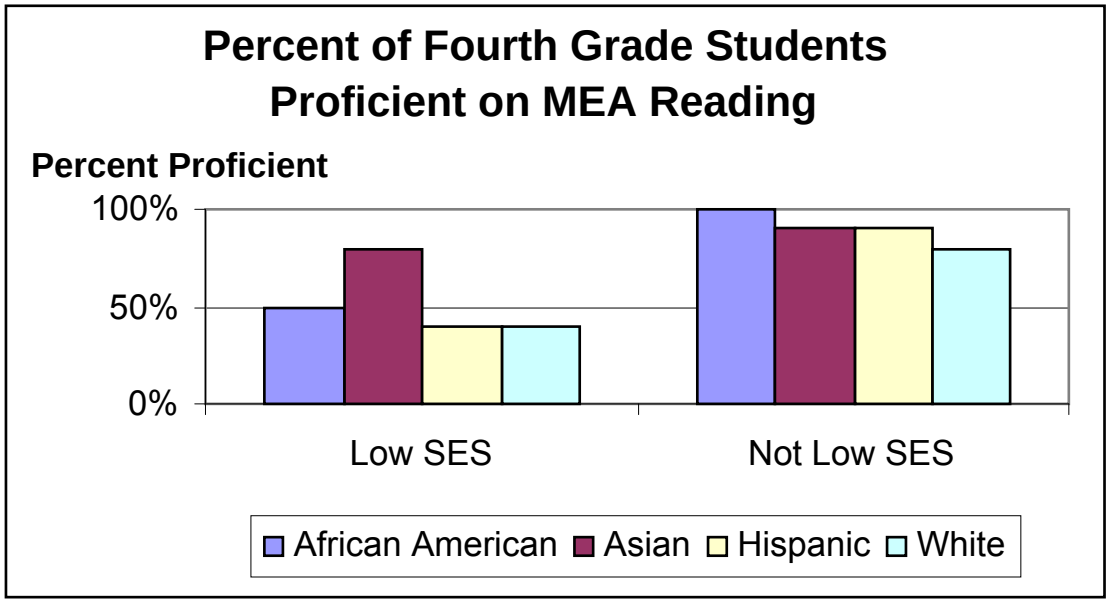
1. What is your basic measure (e.g. percent taking algebra, attendance rate, graduation rate)?
   Response: *percent proficient on MEA Reading*
2. What is the first characteristic for dividing into groups (e.g. race, SES)?
   Response: *race*
3. What is the second characteristic dividing into groups (e.g., lunch statistics)?
   Response: *Economically Disadvantaged*

Percent & Number of Fourth Grade Students Proficient on MEA Reading

	African American	Asian	Hispanic	Native American	White
Low SES	50% n = 20	80% n = 5	40% n = 20	NA n= 0	40% n= 40
Not low SES	100% n = 10	90% n = 10	90% n = 20	NA n= 0	80% n= 50

*Note: cross-tabulating data may be a labor intensive process when the calculations are completed by hand. Use of a pivot table in a computer program such as EXCEL completes the table with ease.

From the above information the following chart was constructed:



MEA Item Analysis Summary

One of the data displays that can yield valuable information is the Performance Profile. While item by item analysis may be interesting especially for classroom teachers, performance on strands of items is often more informative. The following form is provided as a place to track the changes in strand performance over multiple grades. Caution is recommended with this analysis because some strands may be related only to a very small group of test questions. If this is true, the results may not be reliable enough to make determinations. Multiple data from multiple sources should always be considered.

School: _____

Average Percent Correct (Grades 3, 4, 5)

	Grade 3 (n=)			Grade 4 (n=)			Gr
	Our Students	**Nation or State**	**Difference**	**Our Students**	**Nation or State**	**Difference**	**Our Students**
READING VOCABULARY							
READING COMPREHENSION							
Factual Understanding							
Inference and Interpretation							
Analysis and Generalization							
MATH CONCEPTS and ESTIMATION							
Number properties & Operations							
Algebra							
Geometry							
NECAPsurement							
Probability & Statistics							
Estimation							
MATH PROBLEM Solving & DATA INTERPRETATION							
Single- Step							
Multi-Step							
Approaches & Procedures							
Read Amounts							
Compare Quantities							
Interpret Relationships							
COMPUTATION							
Add w/ whole numbers							
Subtract w/ whole numbers							
Multiply w/ whole numbers							
Divide w/ whole numbers							
Add/subtract w/ fractions							
Add/subtract w/ decimals							
SCIENCE							
Scientific Inquiry							
Life Science							
Earth and Space Science							
Physical Science							

MEA Item Analysis Summary for Grades 3, 4, 5
Average Percent Correct

Areas of strength

Areas of weakness

Tool 2(data).6. MEA Item Analysis Summary (page 3 of 5)

School: _____

MEA Average Percent Correct (Grades 6, 7, 8)

	Grade 6 (n=)			Grade 7 (n=)			Gr
	Our Students	Nation or State	Difference	Our Students	Nation or State	Difference	Our Students
READING VOCABULARY							
READING COMPREHENSION							
Factual Understanding							
Inference and Interpretation							
Analysis and Generalization							
MATH CONCEPTS and ESTIMATION							
Number properties & Operations							
Algebra							
Geometry							
NECAPsurement							
Probability & Statistics							
Estimation							
MATH PROBLEM Solving & DATA INTERPRETATION							
Single- Step							
Multi-Step							
Approaches & Procedures							
Read Amounts							
Compare Quantities							
Interpret Relationships							
COMPUTATION							
Add w/ whole numbers							
Subtract w/ whole numbers							
Multiply w/ whole numbers							
Divide w/ whole numbers							
Add w/ fractions							
Subtract w/ fractions							
Multiply w/ fractions							
Divide w/ fractions							
Add w/ decimals							
Subtract w/ decimals							
Multiply w/ decimals							
Divide w/ decimals							
SCIENCE							
Scientific Inquiry							
Life Science							
Earth and Space Science							
Physical Science							

MEA Item Analysis Summary for Grades 6, 7, 8
Average Percent Correct

Areas of strength

Areas of weakness

Tool 2(data).6. MEA Item Analysis Summary (page 5 of 5)

School: _____

MHSA Average Percent Correct (Grades 10, 11, 12)

	Grade 10 (n=)				Grade 11 (n=)			Grade 12 (n=)		
	Our Students	Our Students	Nation or State	Difference	Our Students	Nation or State	Difference	Our Students	Nation or State	Diff
READING VOCABULARY										
READING COMPREHENSION										
Factual Understanding										
Inference and Interpretation										
Analysis and Generalization										
MATHEMATICS										
Concepts/Procedures										
Data Interpretation										
Problem Solving										
MATH COMPUTATION										
Integers										
Decimals/Percents										
Fractions										
Algebraic Manipulations										
SCIENCE										
Interpreting Information										
Analyzing/Evaluating Information										
Analyzing Scientific Investigations										

MSHA SUMMARY:

Areas of strength

Areas of weakness

Notes

Tool 2(data).7. Additional measures: Examples (page 1 of 2)

Additional Measures

Informed decisions require multiple sources of information. A district assessment plan must include assessments other than MEA /MHSA. The following text and chart discusses multiple measures used in the classroom to measure student achievement. All measures should have the highest degree of objectivity, technical adequacy, and alignment possible. The convergence of evidence becomes a powerful indicator for professional development goals.

To make informed decisions about goals for student learning and therefore, content for professional development, district and school personnel often need additional or more detailed information about what their students know and understand—information that may not be available from standardized tests such as MEA /MHSA.

In reading, for example, primary teachers frequently keep a profile of every student that includes each student's ability to recognize and name letters, associate sounds with letters and blends, and develop a sight vocabulary as well as a "running record" of a student's word attack skills and comprehension when reading from leveled materials. In other words, while the MEA might indicate that a student has deficits in word attack skills, the teacher responsible for instructing that student will want to know exactly what skills a student has mastered and which require additional instruction.

Upper elementary and secondary teachers, when encountering students with poor reading skills, also will want to pinpoint the causes for a student's poor performance. Tests such as the *Names Test* enable a teacher to plot exactly what (if any) difficulties a student is experiencing with phonics. The *Basic Reading Inventory*, an individualized test for students up through grade nine, helps the teacher diagnose problems in fluency, sight vocabulary, word attack skills and comprehension.

Standardized tests of mathematical skills and understanding provide information on areas of difficulty for students that may again need elaboration with additional measures. For example, developers of the *Rational Numbers Project* curriculum have developed an interview protocol for probing student understanding of math concepts as well as their ability to apply math concepts in practical areas.

Teachers of science generally expect their students to master not only information in the various disciplines but processes for getting information. That is, the student is expected to know and use a systematic process for setting and testing hypotheses, precise laboratory techniques for measurement, and careful observation and recording of results. Science teachers may assess their students with teacher-made paper and pencil tests and observe them in performance tasks to made judgments about their knowledge and skill.

Examples of Additional Measures

The type of additional measure teachers might employ is determined by their questions about their students' knowledge, skill and understanding within any given discipline.

In addition to the standardized test used by a district or state, teachers may decide to administer a different standardized test. For example, a district that administers the *MEA* once a year may decide to use the *Stanford Diagnostic Reading Test* (SDRT4) – a standardized test – to gain additional information about their students in a specific subject area. Or, they may decide to use a standardized test, which is individually administered, such as the *Gray Oral Reading Test* or the *Durrell Analysis of Reading Difficulty*, with a sample of students experiencing difficulty with reading.

Teachers seeking additional information about student knowledge and skills in specific areas have another valuable option in the less formal–yet widely published and distributed–measures such as *Fry's Sight Words Test* and the *Beginning Phonics Skill Test*. Some rubrics fit this category as well, although some are locally developed.

Teacher-made tests add another dimension of measurement to teacher options for assessment. The advantage of teacher-made tests, of course, is their alignment with what is taught. Whether multiple choice, short answer, matching, or essay items are employed, the teacher can determine if students can demonstrate mastery of the material covered in his/her course.

Informal or "authentic" assessments often add texture and context to our understanding of what students know and understand. Systematic observation and checklists provide invaluable insight into a student's mind. A checklist while conducting a book talk or an observation protocol as students demonstrate their knowledge in a science laboratory can provide diagnostic as well as summative or formative information.

Interviews with students also provide a window into the student's mind. Whether a teacher interviews an individual student (as in the Rational Numbers Project studies) or listens to students working in cooperative pairs working through a problem-solving flow chart (as described in David and Roger Johnson's *Meaningful and Manageable Assessment Through Cooperative Learning*), listening to students provides information about their understanding rarely available from other sources.

There are many sources of additional measures. We are not suggesting you embark on massive and time-consuming measurement projects but merely pointing out that one measure of a student's knowledge, skill and understanding in any discipline rarely provides all the information needed to guide instruction, and thus to guide decisions about professional development content.

Tool 2(data).8. Analyzing & Reporting Our Data – Response Sheet (1 page)

Analyze and Report Data – Response Sheet

This worksheet provides a structured way to facilitate a discussion about data. Recording the team's responses to the questions regarding the data provides useful documentation about the findings and implications. This information will support goal setting and other decision making about professional development.

School Name: _____ Data Analyzed By: _____

Data Collection Period: _____ Date of Analysis: _____

Type of Data Analyzed: *(Check the data source you are analyzing.)*

Student Performance Data

___ MEA

___ Diagnostic: _____

___ Grades or Progress Indicators

___ Other: _____

Other Data

___ Other: _____

Implementation Data

___ _____

___ _____

___ _____

___ _____

___ Other: _____

---

1. What do you notice when you look at these data? What are you comfortable saying about student or staff performance based on these results?

2. What additional questions do these data generate?

3. What do these data indicate students need to work on? Based on these data, what can we infer teachers/administrators need to work on?

4. What do the results and their implications mean for your district's comprehensive school improvement plan/district career development plan?

Notes

Tool 2(data).9 Operating Principles for Collecting/Analyzing Data (1 page)

Quality Standards for Collecting/Analyzing Student Data

List actions taken to support data collection and the analysis of student data. Identify actions needed to ensure that this component of the Maine Professional Development Model is fully supported. Consider possible pitfalls and strategies to avoid them.

Focus on Research to Drive Curriculum, Instruction and Assessment:

Actions Taken:

Actions Needed:

Participative Decision Making:

Actions Taken:

Actions Needed:

Organizational Alignment:

Actions Taken:

Actions Needed:

Focus on Results:

Actions Taken:

Actions Needed:

Notes