

Data Review Protocols

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In the following report, Hanover Research recommends protocols for district, school, and professional learning community data review and presents a literature review that examines data collection and analysis processes at these levels.

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EXECUTIVE SUMMARY AND KEY FINDINGS

INTRODUCTION

This report examines data review protocols, with a specific focus on processes for streamlining data collection and analysis for large bodies of data. The report proceeds in four sections. Sections I through III present protocols for district-, school-, and professional learning community-level data reviews. The recommended protocols address the formation of a data team, data collection, development of guiding questions, and data analysis at each level. The final section discusses a selection of evidence that underpins the recommended protocols and describes effective data review practices in greater detail.

KEY FINDINGS

- **Nationwide, many school districts have been overwhelmed by the volume of data available for analysis.** To manage data effectively, experts recommend that district leaders assign responsibility appropriately, approach data collection with intentionality, and analyze data through a clearly articulated process. Training and professional development opportunities with regard to data collection technology and data analysis can support all staff members in the responsible and consistent use of data.
- **Guiding questions for data review must be developed within the context of the district, school, or professional learning community.** Rather than attempting to analyze an entire body of evidence, leaders should ask guiding questions with regard to a small number of areas of interest or concern. Questions guiding the data review should be specific to those areas of interest or concern as well as any hypotheses that may explain a circumstance in the district.
- **High-quality data review protocols share many commonalities.** In general, data review protocols require the implementation of a diverse data team, at least two rounds of brainstorming and data analysis over the course of a single data review, and the development of testable hypotheses and/or guiding questions.
- **Further, data reviews at district-, school- and professional learning community-levels may follow a uniform, six-step format.** In this report, the recommended data review protocol for all three levels are comprised of similar elements: (1) construct a data team, (2) inventory high-quality data, (3) identify areas of concern and/or focusing questions, (4) form hypotheses and/or clarifying questions based on actionable data, (5) data analysis, and (6) return to data.
- **However, while the data review protocols in this report share a common six-step format, key variations exist between the specific implementation of the protocols at the district-, school-, and professional learning community-levels.**
 - For example, while district data teams consist of central office leaders, school data teams should be comprised of a principal, a data manager, a central office liaison, and teacher representatives. Key questions addressed during the school-

level review process have a narrower focus than district-level inquiries, specifically examining school-level outcomes.

- Similarly, professional learning community-led data reviews are similar in structure to that of the district- and school-led reviews, but differ in team composition and information use. Teacher teams may be organized according to grade level, grade span, or subject matter. They generally use data analysis to investigate student performance and adjust instruction accordingly. PLC data teams draw information from frequent, informal student assessments and are therefore able to generate highly specific findings during data analysis.

SECTION I: RECOMMENDED DISTRICT PROTOCOL

In preparing this report, Hanover Research reviewed a substantial body of literature on the topic of district-level data collection, interpretation, and use. Based on that review, we recommend that school districts take the following steps to implement a data review protocol. The body of this report highlights the evidence underpinning these recommendations and expands on effective practices in district-level data review.

STEP 1: CONSTRUCT A DATA TEAM

To support effective data analysis at the district level, district leaders should ensure that they have assembled a complete data team. The district's data team should include the following team members:

- Data managers who have the capacity to collect, access, statistically interpret, and display available data
- Educators with the experience necessary for developing hypotheses about the underlying influences in the data
- Administrators with the power to make decisions regarding data collection and take action in response to findings from the data
- Individuals qualified to provide training or professional development to stakeholders responsible for interpreting or using student data
- Individuals responsible for communicating about student data with all relevant stakeholders

STEP 2: INVENTORY HIGH-QUALITY DATA

To develop appropriate guiding questions for data analysis, the data team and any other relevant stakeholders participating in the data analysis process must understand what usable data is available. Data may be collected from a variety of sources, including state assessments, formative assessments, student academic and behavioral records, surveys, and demographic documentation. Relevant data points for district-level analysis may include any data listed in Figure 1.1, on the next page. In addition to documenting which data sets are available to decision-makers, the inventorying process should also identify the categories into which each data set could be disaggregated (e.g., demographic group, grade level, school level, etc.). The data inventory should be available to all members of the data team.

Figure 1.1: Potential Data Sets

DEMOGRAPHICS	PERCEPTIONS	SCHOOL PROCESSES	STUDENT OUTCOMES
<ul style="list-style-type: none"> - Race - Gender - Special education - Grade level - Lunch status 	<ul style="list-style-type: none"> - Values - Beliefs - Perceptions teachers, parents, and students have of the learning environment 	<ul style="list-style-type: none"> - Programs - Instruction - Curriculum - Processes - Policies - Procedures - Practices 	<ul style="list-style-type: none"> - Assessments - Course grades - GPA - Teacher observations - Attendance - Dropout rate

Source: Massachusetts Department of Elementary and Secondary Education¹

STEP 3: IDENTIFY AREAS OF CONCERN AND/OR FOCUSING QUESTIONS

Experts in data management and analysis discourage data mining, that is, the practice of sorting through large bodies of data in the hope of identifying a meaningful trend or finding. Rather, district leaders should approach the data with specific questions in mind. The first step in formulating those questions is to identify primary areas of concern or focusing questions. We recommend school districts select areas of concern among the following:

- Goals described in the district’s strategic plan
- Goals established in school improvement plans
- Output available from the district’s early warning system
- Emerging concerns or areas of interest not yet articulated in any official document

To articulate an area of concern, the data team should create a concrete and measurable statement that reflects a known fact about the district, such as the following statement:

District did not meet State Target for Indicator 5a (Educational Environment, inside general education 80% or more of the day).²

Alternatively, data team members could articulate a focusing question about a circumstance in the district, such as the following question:

What are the characteristics and performance levels of students with high absence rates?³

The number of areas of concern and/or focusing questions that the district’s data team may examine on a quarterly basis depends largely on the time available for a data review. For a quarterly review, we recommend concentrating on 3 to 5 areas of focusing questions.

¹ Taken verbatim from: “District Data Team Toolkit.” Massachusetts Department of Elementary and Secondary Education, p. 122. <http://www.doe.mass.edu/apa/ucd/ddtt/toolkit.pdf>

² “A Root Cause Analysis Process.” Illinois State Board of Education, 2010, p. 16. http://www.isbe.net/spec-ed/conf/2010/pdf/session3_root.pdf

³ Adapted from: “District Data Team Toolkit,” Op. cit., pp. 124-125.

STEP 4: FORM HYPOTHESES AND/OR CLARIFYING QUESTIONS BASED ON ACTIONABLE DATA

For each **area of concern** identified, the data team should brainstorm potential explanations for the stated circumstance. These hypotheses should be **testable** with the data available to the data team and described in the data inventory. To develop hypotheses, data team members may consider the following questions:

- **What practices in the district (e.g., disciplinary policy, school start times) may have contributed to the current circumstance?** By identifying district practices that influence an area of concern, the data team narrows the scope of the data review. For instance, if the data team hypothesizes that school start time influences tardiness, the team can then pull data on school tardiness disaggregated by school start time.
- **Is any single student population (or school, grade level, or other group) disproportionately affected by the current circumstance?** Identifying specific student populations affected by a given circumstance can focus the data review and enable district leaders to implement targeted solutions.
- **What changes could the district make to resolve the current circumstance?** By considering solutions to a circumstance, the data team may reveal an underlying problem. For instance, a data team may hypothesize that an underperforming school could improve with more teacher professional development. Based on that hypothesis, the data team could examine differences in professional development opportunities from school to school.

If the data team has developed **focusing questions** to guide the data review, then they may develop **clarifying questions** that delve deeper into the initial focusing question. Like hypotheses, the clarifying questions should consider a range of influential factors, including district practices, subgroups, and potential solutions to a circumstance. For instance, the following clarifying questions may accompany the aforementioned focusing question:

Focusing question: What are the characteristics and performance levels of students with high absence rates?

Potential clarifying questions:

- What is the relationship between absenteeism and performance on state assessments?
- Which subgroups and grade levels have the highest absence rates? Lowest?
- When does high absenteeism occur throughout the school year?
- How does the district's absence rate compare to the state rate?⁴

Once the data team has articulated testable hypotheses and/or clarifying questions, they may select relevant data for analysis. Data team members may refer to the data inventory to select relevant data sets on the basis of the following questions:

⁴ Adapted from: Ibid., pp. 124-125.

- What data are available in relationship to the problem/issue?
- What time periods are the data referencing or is needed?
- Are these data important for improvement?⁵

STEP 5: DATA ANALYSIS

Once the responsible data team member or members have gathered data to test the hypotheses or answer the clarifying questions articulated in Step 4, the data team may reconvene to interpret the data. Ideally, these data will be presented in a manner accessible to all participants in the analysis; this may mean use of a variety of graphs and tables appropriate to the data set.

Data team members may share initial observations of the data and delve deeper by searching for trends or unexpected findings. Questions that may guide the observation process include:

- How do data sets (or populations) compare to each other? (Such as comparing one grade to another, or school vs. district vs. state)
- What are the commonalities among a given data set (or population)? (Such as among students who are scoring below standard, or those who are achieving)
- What patterns or similarities are evident across different data sets? (Such as comparing local formative assessment data with state assessments, or comparing student achievement with teacher attendance)
- What inconsistencies or discrepancies (if any) are evident?
- What is not represented in the data?
- What questions do the data raise?⁶

Finally, to interpret the observations, team members may consider the following additional questions:

- What assumptions might be underneath what we are noticing in the data?
- What clues help explain why a certain population is meeting or missing targets?
- What areas in the data stand out as needing further explanation?
- What patterns or themes do we see in our observations?
- Which of these observations are most relevant and important to our inquiry?
- ***Based on our observations, what do we know now?***⁷

⁵ Adapted from: "A Root Cause Analysis Process," Op. cit., p. 26.

⁶ Adapted from: "District Data Team Toolkit," Op. cit., pp. 201-202.

⁷ Adapted from: Ibid., pp. 201-202.

STEP 6: RETURN TO THE DATA

Steps 1-5 recommended in this document are intended to support the data team in precise data selection to support data-driven decision making; however, data review frequently inspires new questions that require additional data. School districts may implement an additional process for gathering and interpreting data to address findings from the Step 5 data analysis. The process of returning to the data to answer additional questions may be part of the quarterly review or may be a feature of the subsequent quarter's data review.

SECTION II: RECOMMENDED SCHOOL PROTOCOL

The following section presents a data review protocol for the school level. It is based on a review of relevant literature and is structured much the same as the district-level protocol. **The fundamental principles underpinning the data review process should follow the same six-step process all levels of implementation (district, school, or teacher-level). However, the substance of each step varies according to the key personnel, data, and driving questions that are specific to the school level.**

STEP 1: CONSTRUCT A DATA TEAM

At the school-level, it is important that the data team be large enough to represent a variety of perspectives, but not so large as to prevent effective communication.⁸ Generally, three to five team members should be sufficient to achieve the optimal balance. It is recommended for a school-level data team be comprised of the following:

- An administrative leader (i.e., principal or assistant principal) to lend credibility to data review endeavors and to support action following data review
- A school-level data manager who has the expertise to guide data collection and analysis
- Teacher representatives with the “on-the-ground” knowledge to identify potential concerns to address in data review and propose hypotheses for root causes of trends in the data (e.g., department heads, special education coordinator, lead teachers)
- A central office liaison who can communicate district priorities to school leaders and can report school data review results back to the district leadership⁹

STEP 2: INVENTORY HIGH-QUALITY DATA

Data review at the school-level can draw from similar data sets as district-level analysis. The demographic, perception, process, and outcome data available to school leaders is comparable to that available to district leaders, but should be school specific. It is important for members of the data team to acquaint themselves with the data, as this information will guide the types of inquiries the team can make. Relevant data points for school-level analysis may include any of data listed in Figure 2.1, on the next page. In addition to documenting which data sets are available to decision-makers, the inventorying process should also identify the categories into which each data set could be disaggregated (e.g.,

⁸ “Facilitating District-wide Improvement in Instructional Practice and Student Performance Using Teacher-Based Teams.” Ohio Department of Education, January 2010. p. 10
<https://education.ohio.gov/getattachment/Topics/School-Improvement/Transforming-Schools/Ohio-Improvement-Process-OIP-Resources-2012/Complete-OIP-Guide.pdf.aspx>

⁹ Geier, R. and S. Smith. “District and School Data Team Toolkit.” Washington School Information Processing Cooperative, 2012. p. 23. <http://www.k12.wa.us/CEDARS/Data/pubdocs/FullToolkit.pdf>

demographic group, grade level, school level, etc.). The data inventory should be available to all members of the data team.

Figure 2.1: Potential Data Sets

DEMOGRAPHICS	PERCEPTIONS	SCHOOL PROCESSES	STUDENT OUTCOMES
<ul style="list-style-type: none"> - Race - Gender - Special education - Grade level - Lunch status 	<ul style="list-style-type: none"> - Values - Beliefs - Perceptions teachers, parents, and students have of the learning environment 	<ul style="list-style-type: none"> - Programs - Instruction - Curriculum - Processes - Policies - Procedures - Practices 	<ul style="list-style-type: none"> - Assessments - Course grades - GPA - Teacher observations - Attendance - Dropout rate

Source: Massachusetts Department of Elementary and Secondary Education¹⁰

As an example, Glen Haven Elementary School in Montgomery County Public Schools (MCPS) conducted a review of the efficacy of English for Speakers of Other Languages (ESOL) programming. The school’s data team drew from a number of data sets and sources, presented in Figure 2.2 below.

Figure 2.2: MCPS ESOL Program Data Sets

DATA SETS	DATA SOURCES
Demographics	
Special Education	Information Management Services
Perceptions	
Teacher Perceptions	Staff Development/Needs Assessment Survey
School Processes	
Instruction	Weekly lesson plans
	Staff development agendas
	Monthly training agendas
	Master schedule
Programs	Overview of school programs
	Overview of county programs
Student Outcomes	
Assessments	MCPS Assessment Program – Primary Reading
	Comprehensive Test of Basic Skills (CTBS)
	Maryland School Assessment (MSA)
	IDEA Proficiency Test (IPT)
	Stanford Diagnostic Reading Test (SDRT)
	Dynamic Indicators of Basic Early Literacy (DIBELS)
Course Grades	Formative Assessments
	Report Cards

Source: Glen Haven Elementary School¹¹

¹⁰ Taken verbatim from: “District Data Team Toolkit,” Op. cit., p. 122.

¹¹ Adapted from: “Instructional Leadership Through Data-Driven Decision-Making.” Glen Haven Elementary School, September 27, 2005. pp. 2-4. <http://www.montgomeryschoolsmd.org/info/baldrige/leadership/addresources>.

STEP 3: IDENTIFY AREAS OF CONCERN AND/OR CLARIFYING QUESTIONS

As at the district level, data mining can be time-consuming and an ineffective way to identify areas for concern. Rather, school leaders should approach the data with specific questions in mind. The first step in formulating those questions is to identify primary areas of concern or focusing questions. We recommend school districts select areas of concern among the following:

- Goals described in the district’s strategic plan
- Goals established in school improvement plans
- Early warning system outputs
- Emerging concerns or areas of interest not yet articulated in any official document

To articulate an area of concern, the data team should create a concrete and measurable statement that reflects a known fact about the school, such as the following statement:

Formative and standardized data indicate a weakness in general reading purposes and reading comprehension [for ESOL students].¹²

Alternatively, data team members could articulate a focusing question about a circumstance in the school, such as the following question:

Are ESOL programs in Glen Haven Elementary School effectively helping students achieve proficiency in English?¹³

The number of areas of concern and/or focusing questions that the school’s data team may examine on a quarterly basis depends largely on the time available for a data review. For a quarterly review, we recommend concentrating on 3 to 5 areas of focusing questions.

STEP 4: FORM HYPOTHESIS AND/OR CLARIFYING QUESTIONS BASED ON ACTIONABLE DATA

For each **area of concern** identified, the data team should brainstorm potential explanations for the stated circumstance. These hypotheses should be **testable** with the data available to the data team and described in the data inventory. To develop hypotheses, data team members may consider the following questions:

- **What practices in the school (e.g., disciplinary policy, school start times) may have contributed to the current circumstance?** By identifying school practices that influence an area of concern, the data team narrows the scope of the data review. For instance, if the data team hypothesizes that the school’s placement system for ESOL students is misplacing students, the team might collect student performance data and disaggregate it by level and type of learning intervention.

¹² Adapted from: Ibid., p. 5.

¹³ Adapted from: Ibid., p. 2.

- **Is any single student population (grade level, or other group) disproportionately affected by the current circumstance?** Identifying specific student populations affected by a given circumstance can focus the data review and enable school leaders to implement targeted solutions.
- **What changes could the school make to resolve the current circumstance?** By considering solutions to a circumstance, the data team may reveal an underlying problem. For instance, a data team may hypothesize that underperforming special education students could improve by moving from substantially separate programs to inclusion programs. Based on that hypothesis, the data team could examine differences in student achievement for each program type.

If the data team has developed **focusing questions** to guide the data review, then they may develop **clarifying questions** that delve deeper into the initial focusing question. Like hypotheses, the clarifying questions should consider a range of influential factors, including school practices, subgroups, and potential solutions to a circumstance. For instance, the following clarifying questions may accompany the aforementioned focusing question:

Focusing question: Are ESOL programs in Glen Haven Elementary School effectively helping students achieve proficiency in English?

Potential clarifying questions:

- How do third, fourth, and fifth grade ESOL students perform on the county assessment?
- What are the percent of ESOL students in the advanced and proficient categories?
- In which subtests on the norm-referenced achievement tests did ESOL students perform best? Worst?
- How do the scores of ESOL students compare to other students' in the district?¹⁴

Once the data team has articulated testable hypotheses and/or clarifying questions, they may select relevant data for analysis. Data team members may refer to the data inventory to select relevant data sets on the basis of the following questions:

- What data are available in relationship to the problem/issue?
- What time periods are the data referencing or is needed?
- Are these data important for improvement?¹⁵

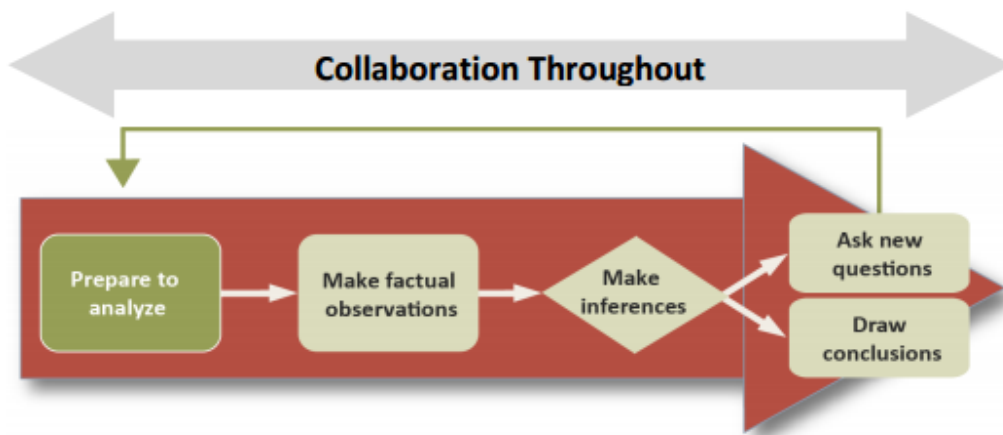
¹⁴ Adapted from: Ibid., p. 2.

¹⁵ Adapted from: "A Root Cause Analysis Process," Op. cit., p. 26.

STEP 5: DATA ANALYSIS

Upon collection of relevant data to test hypotheses formed in Step 4, the data team should reconvene to analyze data. Ideally, these data will be presented in a manner accessible to all participants in the analysis; this may involve a variety of graphs and tables appropriate to the data set. Figure 2.3 presents a broad overview of the school level data analysis process.

Figure 2.3: School Level Data Analysis Process



Source: Washington School Information Processing Cooperative¹⁶

Initial discussion should focus on identifying observable facts apparent based on the data. Team members ought to refrain from making inferences until they have examined factual observations – picking out trends and unexpected results. The team may guide their initial observations using questions such as:

- How do data sets (or populations) compare to each other? (Such as comparing one grade to another, or school vs. district vs. state)
- What are the commonalities among a given data set (or population)? (Such as among students who are scoring below standard, or those who are achieving)
- What patterns or similarities are evident across different data sets? (Such as comparing local formative assessment data with state assessments, or comparing student achievement with teacher attendance)
- What inconsistencies or discrepancies (if any) are evident?
- What is not represented in the data?
- What questions do the data raise?¹⁷

The next step in the process is to interpret data by brainstorming causes of observed trends, noting where additional data is needed to definitively answer a question, and proposing

¹⁶ “District Data Team Toolkit,” Op. cit., pp. 122.

¹⁷ Adapted from: “District Data Team Toolkit,” Op. cit., pp. 201-202.

answers to hypotheses formulated in Step 4.¹⁸ To interpret the observations, team members may consider the following additional questions:

- What assumptions might be underneath what we are noticing in the data?
- What clues help explain why a certain population is meeting or missing targets?
- What areas in the data stand out as needing further explanation?
- What patterns or themes do we see in our observations?
- Which of these observations are most relevant and important to our inquiry?
- ***Based on our observations, what do we know now?***¹⁹

STEP 6: RETURN TO THE DATA

Steps 1-5 recommended in this document are intended to support the data team in precise data selection to support data-driven decision making; however, data review frequently inspires new questions that require additional data. School districts may implement an additional process for gathering and interpreting data to address findings from the Step 5 data analysis. The process of returning to the data to answer additional questions may be part of the quarterly review or may be a feature of the subsequent quarter's data review.

¹⁸ "Data Driven Dialogue." School Reform Initiative, 2002. p. 5.
http://schoolreforminitiative.org/doc/data_driven_dialogue.pdf

¹⁹ Adapted from: "District Data Team Toolkit," Op. cit., pp. 201-202.

SECTION III: RECOMMENDED PROFESSIONAL LEARNING COMMUNITY PROTOCOL

The following section presents a data review protocol for professional learning communities (PLC). It is based on a review of relevant literature and is structured similarly to the school- and district-level protocols. **Again, PLC data team members will move through similar steps in the data review process as at the school- and district-levels. However, team members, data sources, and key questions at the PLC-level differ substantially from the other levels.**

STEP 1: CONSTRUCT A DATA TEAM

Data teams for professional learning community data analysis are structured somewhat differently from their school- and district-level counterparts. Unlike the latter, PLC teams should be comprised primarily of teachers. The specific organization of PLC data teams is flexible and can be configured to meet local circumstances. Configurations may include:

- **Grade level** data teams are comprised of teachers from the same grade level.
- **Grade span** data teams are comprised of teachers from a common grade span (e.g., K – 2, 3 – 5, 6 – 8, etc.).
- **Content area** data teams consist of teachers from the same subject area.
- **Special population** data teams include teachers who work with the same student population (e.g., ELL, special education, early childhood).²⁰

Although the data teams at this level are comprised mainly of teachers, they may involve data specialists to facilitate collection and analysis of data. This may result in an external consultant in the team or providing professional development to ensure teachers are fluent in data use.

STEP 2: INVENTORY HIGH-QUALITY DATA

Data analyses conducted by professional learning communities may focus on individual student achievement as opposed to broader questions of perception and policy addressed by school and district data teams.²¹ Therefore, the data used by PLCs to conduct a review are more granular than those used by school and district teams. Information useful to PLC data teams can be taken from a wide array of sources, including state assessments, formative assessments, classroom observations, student academic and behavioral records, student engagement records, and demographic documentation. Relevant data points for

²⁰ “Data Team Configuration Options.” Connecticut State Department of Education, 2006.

<http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/cali/4bdtdatasteamconfigoptions.pdf>

²¹ Adapted from: Gill, B. B.C. Borden, and K. Hallgren. “A Conceptual Framework for Data-Driven Decision Making.” Mathematica Policy Research, June 2, 2014, p. 4. http://www.mathematica-mpr.com/~media/publications/PDFs/education/framework_data-driven_decision_making.pdf

PLC-level analysis may include any data listed in Figure 3.1, on the next page. The data inventory should be available to all members of the data team.

Figure 3.1: Potential Data Sets, PLC-Level

DEMOGRAPHIC	STUDENT OUTCOMES
- Race	- Engagement
- Gender	- Satisfaction
- Special education	- Attendance
- Grade level	- Formative Assessments
- Lunch status	- Summative Assessments
	- Classroom Observation

Source: Doing What Works²²

STEP 3: IDENTIFY AREAS OF CONCERN AND/OR CLARIFYING QUESTIONS

PLC members should approach the data with specific questions in mind. The first step in formulating those questions is to identify primary areas of concern or focusing questions. We recommend school districts select areas of concern among the following:

- Goals described in the district’s strategic plan
- Goals established in school improvement plans
- Early warning system outputs
- Emerging concerns or areas of interest not yet articulated in any official document

To articulate an area of concern, the data team should create a concrete and measurable statement that reflects a known fact about the students, such as the following statement:

Students did not meet the [federal accountability] reading target set by the district.²³

Alternatively, data team members could articulate a focusing question about a student trend, such as the following question:

What are the characteristics of students who are performing below district [federal accountability] targets for reading?²⁴

The number of areas of concern and/or focusing questions that the PLC’s data team may examine on a monthly basis depends largely on the time available for a data review. For a

²² Adapted from: “Data-Informed Decision-Making: A School-Level Blueprint.” Pennsylvania Department of Education, May 2008. p. 3. http://www.opi.pa.gov/streamer/profdev/Supporting_Documents/Essential_3/Rtl_Primary_Rdg_FINAL/Rtl_Rdg_Section05_Prog_Monitor_Diff/Rtl_Rdg_Prog_Monitor_Diff_%20Handouts/HO-11_Data-InformedDecision_Making_blueprint.pdf

²³ Adapted from: “Data Tools for Teacher-Based Teams.” Educational Service Center of Central Ohio, June 2012. p. 3. <http://circlevillecityschools.org/files/user/339/file/TBT%20Data%20Tools%20Pamphlet.pdf>

²⁴ Adapted from: Ibid., p. 3.

monthly review, we recommend concentrating on one area to ensure that sufficient time is devoted to analyzing the problem. However, PLC data teams may work towards several long-term goals – such as those set by the school or district – in addition to monthly goals. In this case, monthly areas of concern should relate to long-term goals.

STEP 4: FORM HYPOTHESIS AND/OR CLARIFYING QUESTIONS BASED ON ACTIONABLE DATA

For each **area of concern** identified, the data team should brainstorm potential explanations for the stated circumstance. These hypotheses should be **testable** with the data available to the data team and described in the data inventory. To develop hypotheses, data team members may consider the following questions:

- **What practices in the classroom (e.g., instructional methods, curriculum pacing) may have contributed to the current circumstance?** By identifying practices that influence an area of concern, the data team narrows the scope of the data review. For instance, if the data team hypothesizes that a certain instructional method is not conveying reading instruction effectively, the team might collect student performance data and disaggregate it by teaching method.
- **Is any single student population (or grade level, or other group) disproportionately affected by the current circumstance?** Identifying specific student populations affected by a given circumstance can focus the data review and enable teachers to implement targeted solutions.
- **What changes could the teachers make to resolve the current circumstance?** By considering solutions to a circumstance, the data team may reveal an underlying problem. For instance, a data team may hypothesize that one instructional approach is more effective than another. Based on that hypothesis, the data team could examine differences in student achievement for each instruction method.

If the data team has developed **focusing questions** to guide the data review, then they may develop **clarifying questions** that delve deeper into the initial focusing question. Like hypotheses, the clarifying questions should consider a range of influential factors, including teacher practices, subgroups, and potential solutions to a circumstance. For instance, the following clarifying questions may accompany the aforementioned focusing question:

Focusing question: What are the characteristics of students who are performing below district [federal accountability] targets for reading?

Potential clarifying questions:

- What percent of your students scored at each proficiency level?
- How do the percentages differ from grade to grade? From classroom to classroom?
- How is your school's performance similar or different than similar schools in your district/area?
- Are there disparities in subgroup performance?²⁵

²⁵ Adapted from: Ibid., p. 4.

Once the data team has articulated testable hypotheses and/or clarifying questions, they may select relevant data for analysis. Data team members may refer to the data inventory to select relevant data sets on the basis of the following questions:

- What data are available in relationship to the problem/issue?
- What time periods are the data referencing or is needed?
- Are these data important for improvement?²⁶

STEP 5: DATA ANALYSIS

After collecting the data needed to investigate hypothesis generated in Step 4, the PLC team may proceed with data analysis. Interpretation is easiest when data is presented in an accessible and compelling format. Figure 3.2 outlines several guidelines for effective data display for teacher data teams.

Figure 3.2: Effective Data Display

PROVIDE COMPLETE TITLE	MAKE CHART SIMPLE AND EASY TO READ
<ul style="list-style-type: none"> ▪ Assessment/Observation name and subject ▪ Grade/Class tested ▪ Date of assessment/observation ▪ Number of those tested 	<ul style="list-style-type: none"> ▪ Appropriate choice of chart/graph style ▪ Good use of space and color ▪ Fonts large enough to read easily ▪ Clearly labeled legend and axes ▪ Appropriate y-axis scale ▪ Data-point values, where helpful

Source: Ohio Department of Education²⁷

Data team members may first share factual observations about the information presented to them. Members should keep in mind that analysis at this stage should center on “only the facts that [they] can observe in the data.”²⁸ They can use the following phrases to guide their observations:

- I observe that...
- Some patterns/trends that I notice are...
- I can count...
- I’m surprised to see...²⁹

Next, the data team may make inferences or draw conclusions about the data based on the factual observations they have made. These conclusions should relate back to hypotheses or clarifying questions laid out in Step 4. Phrases to guide this step of the analysis include:

- I believe the data suggests...because...

²⁶ Adapted from: “A Root Cause Analysis Process,” Op. cit., p. 26.

²⁷ “Facilitating District-wide Improvement in Instructional Practice and Student Performance Using Teacher-Based Teams.” Op. cit. p. 22.

²⁸ “Data Driven Dialogue,” Op. cit., p. 4.

²⁹ Taken verbatim from: Ibid., p. 4.

- Additional data would help me verify/confirm my explanation is...
- I think the following are appropriate solutions/responses that address the needs implied in the data...
- Additional data that would help guide implementation of the solutions/responses and determine if they are working...³⁰

STEP 6: RETURN TO THE DATA

Steps 1-5 recommended in this document are intended to support the data team in precise data selection to support data-driven decision making; however, data review frequently inspires new questions that require additional data. School districts may implement an additional process for gathering and interpreting data to address findings from the Step 5 data analysis. The process of returning to the data to answer additional questions may be part of the quarterly review or may be a feature of the subsequent quarter's data review.

³⁰ Taken verbatim from: Ibid., p. 5.

SECTION IV: LITERATURE REVIEW

This literature review includes an overview of practices and factors relevant to data review processes at the district-, school-, and PLC-level. It concludes with a presentation of two sample protocols for data analysis.

OVERVIEW

KEY FACTORS IN DATA MANAGEMENT AND ANALYSIS

Nationwide, the problem of inaccessible data has become a well-documented one.³¹ The consulting group WestEd recently identified an overabundance of data among the chief obstacles to data-driven decision making and proposed the following three solutions for making district- and school-level data more accessible:

- Educators should form data teams to work on the wealth of data in a collaborative manner, apportioning the data sources among them.
- Guiding questions and framing hypotheses help to streamline the data by identifying the essential data sources and eliminating the less relevant sources. By asking targeted questions around what insights need to be gained in order to make specific instructional changes, educators can get a sense of the importance of particular pieces of data.
- Educators should triangulate among different data sources. Triangulation helps to bring together disparate data in a more manageable and understandable manner.³²

In June 2014, Mathematica Policy Research published a report on data-driven decision-making that echoes and expands the WestEd recommendations. As described below, the WestEd report emphasized the importance of collecting high-quality data that is relevant, diagnostic, and actionable:

- **Assemble high-quality raw data.** Depending on the decision at hand, data might be collected through formative, diagnostic, and summative assessments of students; standardized tests and college and career readiness exams; qualitative interviews, observations, or focus groups; surveys of staff, students, parents, and community

³¹ [1] Mieles, T. and E. Foley. "From Data to Decisions: Lessons from School Districts Using Data Warehousing." Annenberg Institute for School Reform at Brown University, January 2005, p. 1.

<http://annenberginstitute.org/sites/default/files/product/319/files/DataWarehousing.pdf>

[2] Casey, D.C. "Making Data-Driven Decisions in Rural Schools." *Education Week*, September 14, 2011.

http://blogs.edweek.org/edweek/rural_education/2011/09/data-driven_decision_making_in_rural_schools.html

[3] "Data-driven decision making in K-12 schools." Technology Alliance. <http://www.technology-alliance.com/pubspols/dddm/dddm.html>

³² [1] Adapted from: "Roadblocks and Solutions." WestEd. <http://datafordecisions.wested.org/data-use-basics/roadblocks-and-solutions/>

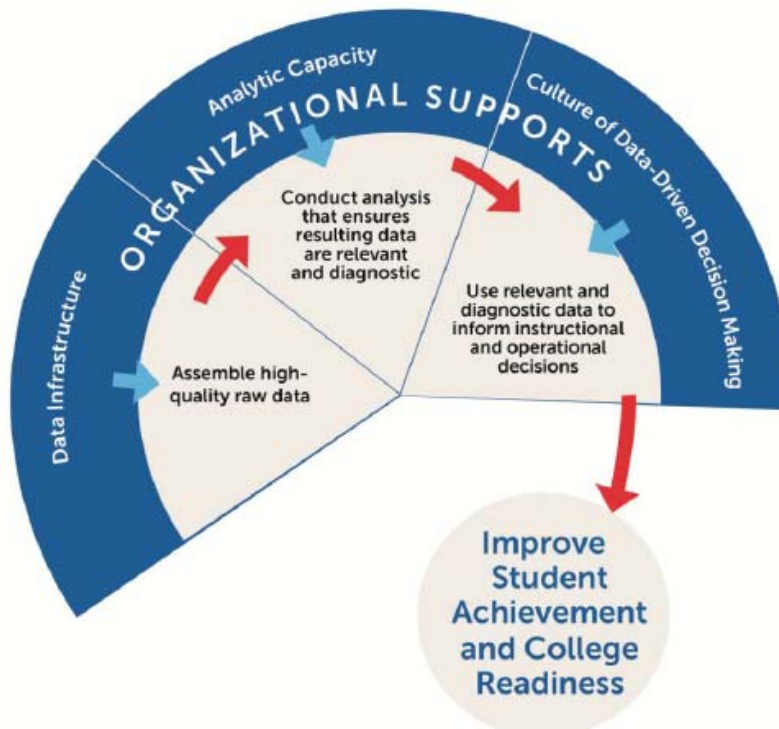
[2] Note: WestEd references the following source as a basis for these recommendations: Love, N., K.E. Stiles, S. Mundry, and K. DiRanna. *The Data Coach's Guide to Improving Learning for All Students: Unleashing the Power of Collaborative Inquiry*, Corwin Press, 2008.

members; financial, human resource, and administrative records; student records and transcripts; or labor, health, human service, education, and statistical agencies.

- **Conduct analysis that ensures resulting data are relevant and diagnostic.** If data are to serve decision making that ultimately improves student outcomes, they must be relevant to the decision maker and appropriately diagnostic for the decision at hand. The key points are these: Data that are not relevant to the decision maker (for instance, because they arrive too late to inform a decision) will not be used; data that are not diagnostic of the issue at hand (for instance, because they mismeasure the effectiveness of staff or programs or do not accurately assess student achievement) may be used in ways that are counterproductive.
- **Use relevant and diagnostic data to inform instructional and operational decisions.** Even the best data and the best analysis will not improve outcomes if the results are not used. A culture of data use is necessary to ensure that (relevant, diagnostic) data are not filed away and forgotten.³³

Figure 4.1 shows how organizational supports, including the data infrastructure, analytic capacity, and data culture, combine with the three essential components of high-quality data analysis to improve student outcomes.

Figure 4.1: Theory of Action and Organizational Supports to Improve Student Outcomes



Source: Mathematica Policy Research³⁴

³³ Adapted from: Gill et al., Op. cit., pp. 2-3.

³⁴ Ibid., p. 2.

Experts also emphasize the importance of developing a culture of data-driven decision making to support high-quality data analysis. The Data Quality Campaign recommends implementation of the guidelines shown in Figure 4.2 to ensure the use of data in decision making and the development of a strong data culture.

Figure 4.2: Guidelines for Encouraging Data Use

- **Use Data to Inform Decisions at All Levels**
 - Develop data management systems that facilitate **real-time access to longitudinal student-level data** and generate standard reports as well as allow customizable queries.
 - **Use data** at all levels **to make decisions** about issues including curriculum, school improvement planning, resource allocation and classroom instruction.
 - Include student-level statistics in multiple channels of communication that target diverse audiences and stakeholders.
 - Provide education stakeholders **professional development** on not just data entry but also data use and analysis.
 - Align curriculum, assessments and grading systems to **local and state content standards** to encourage systemic data use within and across classrooms and schools.
 - **Educate all stakeholder groups**, including the board of education, on the importance of collecting and using robust high-quality data.
 - Don't use data to place blame on people or situations.
- **Build a Culture of Data-Driven Decision Making**
 - Ensure the collection of **multiple types of student-level data**, including longitudinal state, formative and summative assessment; attendance; and demographic data.
 - **Allocate time** in department meetings and professional learning communities, and provide other vehicles for teachers and principals to view, discuss and collaborate using data.
 - Encourage leadership at all levels to **require the use of data** for all meetings and individual interactions.
 - Create and allocate resources for a **continuous improvement system** (such as the Baldrige National Quality Program or the PDSA model) that requires the use of student-level data for key performance indicators.
 - Build a **collaborative relationship with the state education agency** to ensure that state-level collection, reporting and analysis support district data use by delivering timely data in user-friendly formats.
 - Don't assume that you can change the culture without **changing structures and policies** in the district.

Source: Data Quality Campaign³⁵

INFRASTRUCTURE

As noted in the 2014 Mathematica Policy Research report, an effective data infrastructure provides an important foundation for data analysis. Most data management systems function as either student information systems or learning management systems, as described below.

³⁵ "Data-Driven Districts: Building the Culture and Capacity to Improve Student Achievement." Data Quality Campaign, 2009, p. 8. http://www.dataqualitycampaign.org/files/DQCbrief_FINAL-lowres_2_.pdf

- **Student Information System (SIS):** A software application for the collection, organization and management of student data that includes, but is not limited to, student schedules, enrollment, course history, achievement profile, grades, attendance and demographic information.
- **Learning Management System (LMS):** A software application used by education institutions for planning, delivering and managing, tracking, and reporting of learner events, e-learning programs, educational records, and training content. Learning Management Systems support a variety of instructional resources and settings including virtual, hybrid, online and/or instructor-led instructional settings. On-line assessment, management of continuous professional education, collaborative learning, and training resource management (e.g., facilities, equipment), are also tracked and managed using Learning Management Systems.³⁶

Historically, districts have found basic student information systems sufficient to serve reporting and administrative purposes. In the current era of increased accountability, however, districts increasingly use student data to improve instruction and guide decision making. In 2011, Gartner surveyed 574 district and school leaders to measure educator attitudes toward SIS and LMS solutions. Forty-six percent of school leaders participating in the study reported the use of SIS and LMS solutions to facilitate individualized instruction.³⁷ Smaller numbers of school leaders also reported using SIS and LMS solutions to improve access to student data, increase collaboration among educators, facilitate communication with parents and students, track student performance, and group students for differentiation.³⁸

A 2009 report from the Data Quality Campaign found that best-practice districts commonly implement continuous improvement models, including balanced scorecards and the Plan Do Study Act (PDSA) cycle, to track and use performance indicator data.³⁹ These systems, like early warning systems, illuminate key factors for district leaders to monitor.⁴⁰ In conjunction with data management structures with the capacity to provide timely data from various data sources (e.g., financial data as well as program performance data), district strategic plans and indicator tracking systems facilitate interpretation of key data.⁴¹

³⁶ Reproduced from: "Implementation and Selection Approaches Toward SIS/LMS Solutions." Gartner, 2011, p. 7.
http://www.turningdataintoaction.org/sites/default/files/reports/implementation_and_selection_approaches_toward_sis_lms_solutions.pdf

³⁷ "Education Community Attitudes Toward SIS/LMS Solutions." Gartner Consulting, 2011, p. 29.
http://www.turningdataintoaction.org/sites/default/files/reports/education_community_attitudes_toward_sis_lms_solutions.pdf

³⁸ Ibid.

³⁹ "Data-Driven Districts: Building the Culture and Capacity to Improve Student Achievement," Op. cit., p. 2.

⁴⁰ Davis, M.R. "Data Tools Aim to Predict Student Performance." *Education Week*, February 8, 2012.
<http://www.edweek.org/dd/articles/2012/02/08/02predicting.h05.html>

⁴¹ [1] Gill et al., Op. cit., p. 3.

[2] Hamilton, L. R. Halverson, S. Jackson, E. Mandinach, J. Supovitz, J. Wayman. "Using student achievement data to support instructional decision making." Institute of Education Sciences, 2009, p. 39.
<http://ies.ed.gov/ncee/wwc/PracticeGuide.aspx?sid=12>

IDENTIFYING AND TRAINING PERSONNEL

According to Mathematica Policy Research, “meaningful use of data begins with who will access, analyze, or review the data and for what purpose.”⁴² Personnel responsible for data management and analysis may include internal and external technical experts, district administrators and educators, and district stakeholders, as appropriate.⁴³ At the district level, administrators frequently form data teams to centralize responsibility. Figure 4.3 describes the five key functions of a data team, which may be used to guide the selection of individuals responsible for district data management and analysis processes.

Figure 4.3: Five Key Functions of a District Data Team

Vision and Policy Management	Creating and articulating the vision, setting and modeling expectations, and implementing and upholding policies for data use in the district.
Data Management	Identifying data to be collected, managing data infrastructure and access, and designing meaningful data displays.
Inquiry, Analysis and Action	Developing focusing questions and analyzing data to make district-wide decisions about curriculum, staffing, resources, and professional development.
Professional Development	Providing training and professional development to support district departments, principals, school data teams, and teachers to use data.
Communication and Monitoring	Communicating district-level focusing questions and findings throughout the district. Monitoring the school-level use of data, as well as goals and action plans to identify trends and patterns.

Source: Massachusetts Department of Elementary and Secondary Education⁴⁴

In most cases, district leaders, school leaders, teachers, and other stakeholders responsible for most any aspect of data analysis will require training and professional development to effectively collect and use student data. Areas of professional development may include:

- Implementation of data driven decision making practices;
- How to access and analyze data;
- Using data to change instructional practice; and
- Data management and security⁴⁵

⁴² Gill et al., Op. cit., p. 4.

⁴³ Ibid., pp. 3-4.

⁴⁴ “District Data Team Toolkit,” Op. cit., p. 33.

⁴⁵ Gill et al., Op. cit., pp. 3-4.

The Data Quality Campaign has found that districts that make the most of their data analysis devote a greater proportion of training and professional development to data analysis than to data technology, and, as a result these districts have a greater proportion of staff members who use the data.⁴⁶ Closing the Gap, an organization devoted to improving the use of data to improve student outcomes, similarly recommends districts offer initial and ongoing training tailored to the role of each staff member; the organization also distinguishes between training for use of data management technology and professional development for data-driven decision-making:

[T]raining refers to instruction surrounding how to specifically use the technology system while Professional Development refers to instruction, discussions, and collaborations to help the district use the data from the technology system to facilitate and support decisions at the district, school and classroom levels. Both components are critical in order for an SIS/LMS solution implementation to be successful. Incorporating the appropriate training ensures that users are able to take advantage of the full breath of capabilities acquired as part of the solution. Professional development ensures that the outputs of the solution are used effectively to make classroom, school, and district instructional decisions. **Without both training and professional development, use of the system can become laborious and the true value at the classroom level can go unrealized.**⁴⁷

DATA SELECTION

Although districts may find they have access to a large amount of data, Closing the Gap warns against the collection of more data than the district will have the “capacity or capability to store, mine, and analyze.”⁴⁸ Accordingly, Closing the Gap recommends that district leaders consider the following questions to prioritize which pieces of data to collect:

- Does the data element answer a question that directly supports current and future school, district, state, and national education goals?
- Does the district currently have a means for accurately collecting and displaying the data element across the district?
- Does the district have a means of securely and accurately storing/maintaining the data?⁴⁹

Finally, Closing the Gap further recommends that district leaders select data after consideration of the eventual use of the data, using questions such as these:

- What are the instructional questions the data should answer?
- Which professional learning resources are needed to support the effective use of the data to strengthen classroom practices?

⁴⁶ “Data-Driven Districts: Building the Culture and Capacity to Improve Student Achievement,” Op. cit., p. 4.

⁴⁷ Ibid., p. 4.

⁴⁸ Ibid., p. 6.

⁴⁹ Reproduced from: Ibid., p. 7.

- Which evidence-based instructional practices will the data further enable (e.g., the role of feedback and assessment for learning)?⁵⁰

Closing the Gap recommends districts develop a “data collection and use plan” for each type of data the district intends to collect.⁵¹ The data collection and use plan should include a description of the data the district will collect (as well as any personnel responsible for collection and the frequency of collection), the source where the data is stored prior to the implementation of the new data collection system, the data extraction method and frequency of extraction, the “data owner” or “point of contact” responsible for that type of data, the groups that will use the data, and intended uses for the data once it has been collected.⁵² By explicitly planning for data use in this manner, district leaders are less likely to gather an unmanageable body of data. Figure 4.4 shows a sample data collection and use plan.

Figure 4.4: Data Collection and Use Plan Template for Formative Assessment Results

DATA COLLECTION AND USE PLAN TEMPLATE: FORMATIVE ASSESSMENT RESULTS	
Description:	Class assignment, quiz and test scores, etc. for each student, calculated by all teachers daily
Source:	Acquired learning management system and supporting database
Extraction Method and Frequency:	Grade book screen/report for each student; extracted at the close of each lesson
Data Owner / Point of Contact:	Teachers
Data User:	Teachers, students, parents, counselors, school leadership
Intended Use(s):	This data will be aggregated at the class level by teachers to inform student groupings and identify lessons that require additional time to master. This information will be aggregated monthly by data coaches and department chairs to inform [professional learning community] discussions. This data will be reviewed each marking period by principals to understand trends and patterns in teacher effectiveness, student progress, and understand where additional resources/learning materials may be required. This data will be aggregated across schools each marking period by district staff to understand where new educational programs and resources/learning materials may be required.

Source: Closing the Gap⁵³

To best use the available data, Mathematica Policy Research advises district leaders to distinguish diagnostic information from non-diagnostic information. Diagnostic information should be “sufficiently reliable” and “valid for informing the decision at hand.”⁵⁴ Relevance,

⁵⁰ Reproduced from: Ibid.

⁵¹ “Instructional Data Collection and Use Plan.” Closing the Gap, November 15, 2012, p. 7.

<http://www.turningdataintoaction.org/content/instructional-data-collection-and-use-plan>

⁵² Ibid., p. 7-8

⁵³ Table reproduced from: Ibid., p. 8.

⁵⁴ Gill et al., Op. cit., p. 4.

a key factor in determining a data set’s reliability and validity, is a factor that refers more to the audience and the questions under consideration than to the data itself. For instance, decision-makers at the school- and classroom-level may require more granular data than would be required by decision-makers at the district-level.⁵⁵ At the district-level, decision-makers may require data aggregated “at larger units of analysis,” meaning “teachers rather than students, schools rather than teachers, and so on.”⁵⁶

Determining relevance also requires the individuals conducting the data analysis to exercise caution in drawing conclusions from the data for appropriate purposes. For instance, Mathematica Policy Research encourages leaders to avoid over-generalization with regard to student achievement data:

The relevance of the data to the decision maker and the decision at hand is not sufficient to ensure that the data will move the decision maker in a productive direction. Student achievement data, for example, are certainly relevant to assessing the performance of the school, but **if not analyzed carefully, they could lead to bad inferences about the school’s performance and bad decisions about how to improve the school’s performance.** The same data can be diagnostic for some decisions and not for others. A teacher’s value-added, for example, might be diagnostic for informing a principal’s hiring decision, but it is not, in itself, diagnostic for how to improve the teacher’s practice because it provides no information about what the teacher is doing to achieve his/her value-added.⁵⁷

CONSIDERATIONS FOR SCHOOL AND PROFESSIONAL LEARNING COMMUNITY DATA ANALYSIS

The general process for data-driven decision-making is transferable across all levels of the education system. However, data protocols should be modified to accommodate the specific questions and data relevant to each level (i.e. district, school, PLC, etc.) Primary differences between data review at different levels of the education system include:

- **Data use** – different decision makers will use data for different purposes.
- **Data sets** – as the data review process moves from highly specific (teacher-level) to more generalized (district-level), the type of data needed to answer questions changes.⁵⁸

Figure 4.5 presents an overview of the uses of data analysis at the district-, school-, and teacher-level. Teachers, whether individually or in teams, generally use data to understand the performance and needs of their students. This information can be used to adjust instruction accordingly. School administrators typically examine data to gain insight into the performance and needs of students and teachers. This can then inform modifications to school programs and practices. Finally, data give district administrators insight into performance of schools, students, and staff.

⁵⁵ Ibid., p. 6.

⁵⁶ Ibid., p. 6.

⁵⁷ Ibid., pp. 6-7.

⁵⁸ Ibid., p. 1.

Figure 4.5: Decision Makers and Data Uses





EDUCATIONAL DECISION MAKER	DATA USES
Classroom Teachers	<ul style="list-style-type: none"> - Assessing the needs, strengths, progress, and performance of students - Developing and revising classroom instruction - Understanding professional strengths and weaknesses
School Leaders	<ul style="list-style-type: none"> - Assessing the needs, strengths, progress, and performance of staff and students - Developing and revising school plans, targets, and goals - Monitoring the implementation of school practices, programs, and policies
District Leaders	<ul style="list-style-type: none"> - Assessing the needs, strengths, progress, and performance of schools, staff, and students - Developing and revising district curricula, standards, plans, targets, and goals - Monitoring the implementation and impact of district practices, programs, and policies

Source: Mathematica Policy Research⁵⁹

The data needed to address questions for each decision maker group differ as well. Figure 4.6 on the following page presents the various data needs for teachers, school leaders, and district leaders. In general, data most relevant for teachers involve student outcomes and reflections on teachers' instructional practices. This information may be collected with relative frequency (e.g., daily, weekly, monthly). In contrast, school and district leaders examine high-level student performance data, teacher performance data, and program implementation data less frequently.

⁵⁹ Adapted from: Ibid., p. 5.

Figure 4.6: Relevant Data

Data that are needed (relevant)					
Data refresh rate	Relevant student data	Relevant staff data	Relevant school/program data	Level of detail	
Frequent Weekly, Daily 	Classroom teachers	Prior achievement (individual and class) Specific academic strengths and weaknesses (individual and class)	My value added My professional practice My students' perceptions of me How I might improve my practice	N/A	Specific, Individuated 
	School administrators	Dropout risk (individual) Schoolwide academic needs	Teacher performance (individual) Teacher professional needs (individual) Prospective hires My performance How I might improve my practice	Quality of within-school program implementation	Detailed, Disaggregated 
	Superintendents, school boards, district staff, charter management organization leaders, charter authorizers	Levels of achievement and attainment, by subgroup Satisfaction of students and parents, enrollment rates	Teacher and principal applicant pools Effectiveness of training institutions Principal performance (individual) on multiple dimensions from multiple sources	Quality of within-school program implementation School value-added Program implementation in schools and districtwide School/program costs per student	
	State education agency officials	Levels of achievement and attainment, by subgroup Satisfaction of students and parents, enrollment rates	Effectiveness of training institutions	School value-added	General, Aggregated 

Source: Mathematica Policy Research⁶⁰

⁶⁰ Ibid., p. 7.

SAMPLE DATA ANALYSIS PROTOCOLS

This subsection describes two protocols for data review:

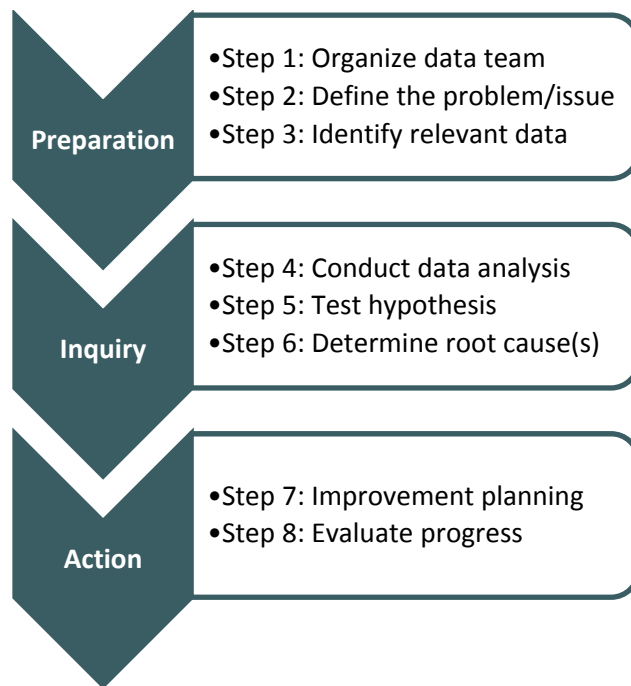
- A root cause analysis protocol, as recommended by the Illinois State Board of Education; and
- A cycle of inquiry, as recommended by the Massachusetts Department of Elementary and Secondary Education.

ROOT CAUSE ANALYSIS

Root cause analysis is a holistic tool “used both reactively, to investigate an adverse event that already has occurred, and proactively, to analyze and improve processes and systems before they break down.”⁶¹ Root cause analysis streamlines data review and facilitates discussion by guiding leaders to use data to answer specific questions about an organization’s performance.⁶²

Root cause analysis may take many forms, although some processes are better suited for the education sector. Figure 4.7 shows the eight-step root cause analysis framework supported by the Illinois State Board of Education.

Figure 4.7: Root Cause Analysis



Source: Illinois State Board of Education⁶³

⁶¹ Preuss, P. *School Leader’s Guide to Root Cause Analysis*, Routledge, 2003. Cited in: “A Root Cause Analysis Process,” Op. cit., p. 3.

⁶² “A Root Cause Analysis Process,” Op. cit., p. 5.

⁶³ Ibid., p. 10.

As generally recommended in data analysis, this root cause framework recommends leaders begin by establishing a data team responsible for key aspects of the data analysis process. The data team is responsible for tasks that precede and follow the actual data analysis, including:

- Identifying problems
- Determining additional data needed
- Determining baseline levels
- Determining other assessments of progress⁶⁴

In defining “the problem” at the center of the root cause analysis, leaders prepare a “clear, measurable statement,” such as the following:

District did not meet State Target for Indicator 5a (Educational Environment, inside general education 80% or more of the day).⁶⁵

By stating the problem clearly, as in the preceding example, data team members can better determine what data they should consider to discuss the problem; in this case, leaders may examine attendance rates disaggregated by school or student demographic, for example. To identify relevant data, data team members answer three questions:

- What’s available in relationship to the problem/issue?
- What time period are the data referencing or is needed?
- Is this data important for improvement?⁶⁶

In selecting data that answers these three questions, the data team may choose to disaggregate the data by student demographics or levels (e.g., district, building, grade level, or classroom).⁶⁷ Most important is that the data used in this analysis is timely, reliable (meaning that is consistent and objective), valid (meaning that it is complete and credible), secure (for data sets that contain sensitive or private information), and useful (meaning that it is interpretable, relevant, transparent, and accessible).⁶⁸

Once data team members have identified and disaggregated the relevant data, they are responsible for approaching the data with an objective point of view and requesting additional data consultation for any evidence that may be difficult to interpret.⁶⁹ To guide the data discussion, data team members may prepare a visual analysis to illuminate patterns, trends, and variability in the data.⁷⁰

⁶⁴ Adapted from: Ibid., p. 12.

⁶⁵ Ibid., p. 16.

⁶⁶ Taken verbatim from: Ibid., p. 26.

⁶⁷ Ibid., p. 22.

⁶⁸ Ibid., p. 6.

⁶⁹ Ibid., p. 24.

⁷⁰ Ibid., p. 25.

Following data selection, brainstorming and hypothesis testing bring data team members closer to identifying root causes of identified problems. Take, for example, the following observation from district data and the accompanying hypothesis:

Observation: Students with specific learning disabilities who are Hispanic (where English is not the primary language at home) are placed in self contained settings at a higher rate than other students with significant disabilities.

Hypothesis: The District does not meet the needs of targeted students in the general education setting.⁷¹

To test the hypothesis, data team members would consider the following guiding questions:

- What actions in our practice might have contributed to these results?
- Has there been any information that would lead us to reject the stated hypotheses for our data patterns?
- Given our data picture, are there any other possible explanations from our practice that we might pose?⁷²

Finally, using all of the evidence gathered from the data and the guiding questions, data team members may answer the following additional questions to determine whether the “cause” of a problem may be considered the root cause:

- Would the problem have occurred if the cause had not been present?
- Will the problem reoccur as the result of the same cause if the cause is corrected?
- Will correction of the cause lead to similar events?⁷³

Common indicators that the team has identified the root cause of a problem include the following:

- You run into a dead end asking what caused the proposed root cause.
- Everyone agrees that this is a root cause.
- The cause is logical, makes sense, and provides clarity to the problem.
- The cause is something that you can influence and control.
- If the cause is dissolved/corrected, there is a realistic hope that the problem can be reduced/prevented in the future.⁷⁴

Once the data team has identified the root cause of an identified problem, they may better employ evidence-based practices that address that specific root cause. Specifically, knowing the root cause can facilitate the selection of partners in addressing the root cause, specific

⁷¹ Adapted from: Ibid., p. 29.

⁷² Ibid., p. 31.

⁷³ Preuss, Op. cit. Cited in: “A Root Cause Analysis Process,” Op. cit., p. 34.

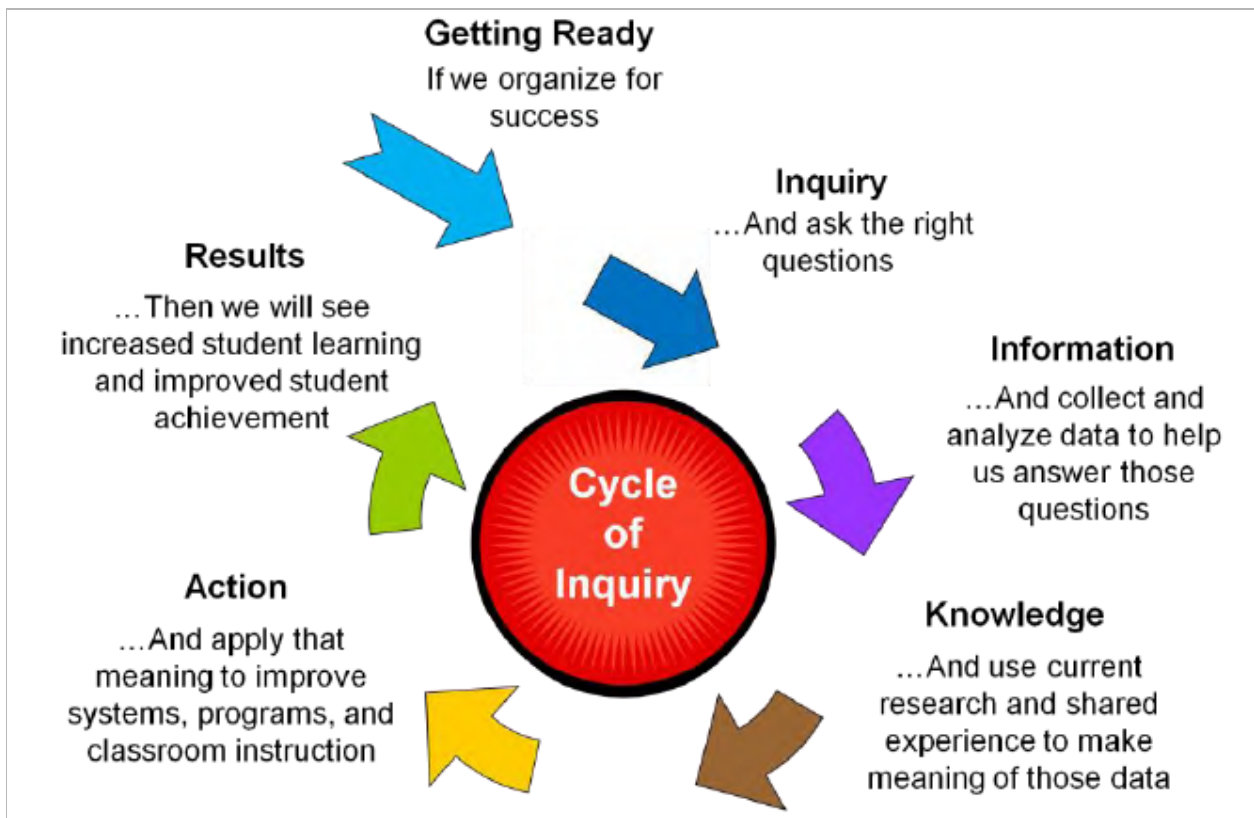
⁷⁴ Ibid.

action steps for addressing the root cause, and short- and long-term indicators to monitor to ensure progress in resolving the identified problem.⁷⁵

CYCLE OF INQUIRY

Nancy Love, the Director of Program Development at Research for Better Teaching, describes collaborative inquiry as “the bridge that enables schools to connect the increasing amount of school data available to improve student learning.”⁷⁶ The Massachusetts Department of Elementary and Secondary Education (MADESE) published a district data team toolkit that relies on the cycle of inquiry, as shown in Figure 4.8, on the following page.

Figure 4.8: Cycle of Inquiry



Source: Public Consulting Group⁷⁷

MADESE describes the district data team as “a cadre of staff who is collectively responsible for the technical, organizational, and substantive aspects of data use.” Data team members are to:

⁷⁵ “A Root Cause Analysis Process,” Op. cit., p. 37-38.

⁷⁶ Love, Op. cit., p. 8.

⁷⁷ Image copyright Public Consulting Group, 2009. Available from: “District Data Team Toolkit,” Op. cit., p. 6.

- Craft questions about accountability, equity, and continuous improvement
- Coordinate the collection, analysis, and dissemination of data displays that are necessary to address these essential questions
- Build action plans
- Monitor progress of improvement initiatives⁷⁸

The MADESE Data Team Toolkit includes checklists and resources for six essential components of district-level data use:

- Getting ready (organize for success)
- Inquiry (ask the right questions)
- Information (collect and analyze data)
- Knowledge (make meaning of data)
- Action (apply meaning)
- Results (look for improvement)⁷⁹

The first stage, “getting ready,” requires that data team members consider 1) whether the district has a vision for data use; 2) whether the district data team is appropriately structured and staffed; 3) the level of assessment literacy of the data team members; 4) whether the district has adequate data technology to inform decision making; 5) whether the available data sets are adequate and accessible; and, finally, 6) whether the data team members “are able to identify and address potential resistance to change before problems occur.”⁸⁰

During the initial phase, data teams must also conduct a data inventory, which will eventually influence the types of questions data team members may ask during the inquiry phase. The data inventory process should help the district:

- Gain a clearer picture of the data currently available to guide inquiry at all levels in the district, and how they are being used
- Identify data that are being collected, but that are not necessarily well-used
- Identify redundancies in data collection that could be eliminated
- Identify additional data elements needed to address district and school improvement and inquiry processes
- Communicate expectations for what to do with particular data⁸¹

⁷⁸ “District Data Team Toolkit,” Op. cit., p. 5.

⁷⁹ Ibid., pp. 11-12.

⁸⁰ Ibid., pp. 19-20.

⁸¹ Taken verbatim from: Ibid., p. 45.

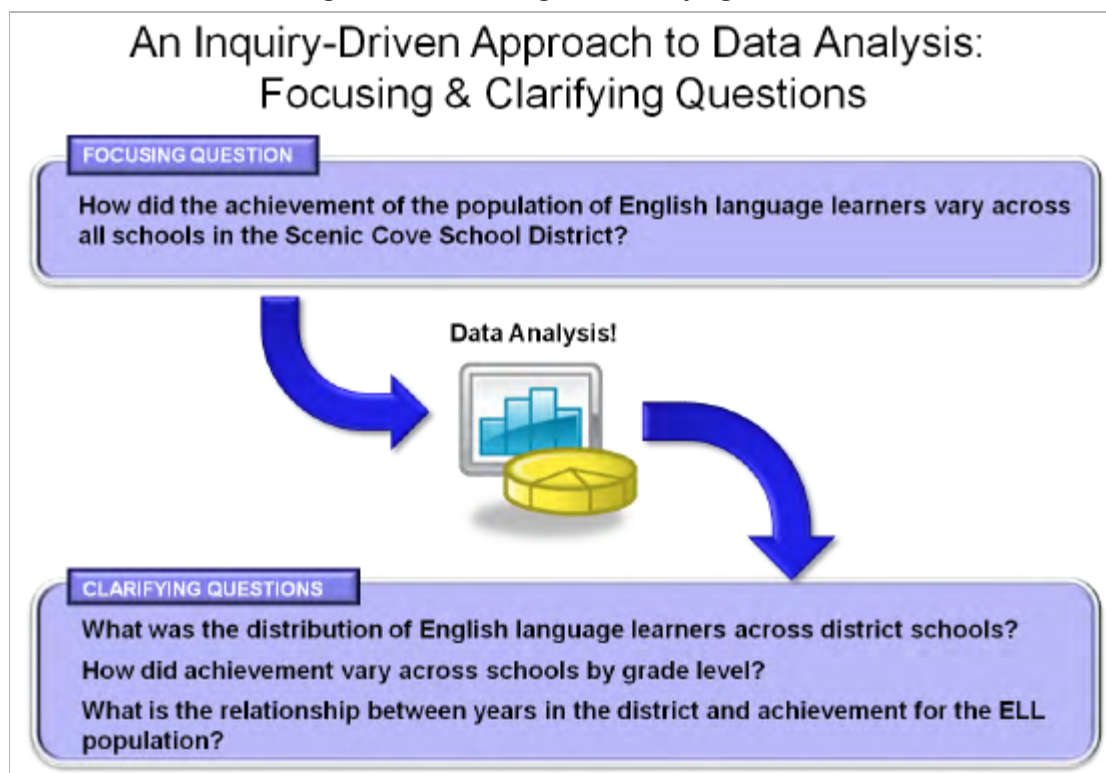
Once the data team is established and organized, the inquiry process requires team members to articulate clear questions to guide the data review process. In crafting these questions, data team members should consider two key factors:

- Does the question relate to something over which the district or school has control?
- Does the question relate to something which, if improved, will have a significant impact on teaching and learning?⁸²

In addition to these two questions, data team members may also consider questions “about factors that can have an effect on teaching and learning, but that cannot be influenced or changed by districts and schools.”⁸³ These questions may be “more descriptive in nature” to provide the data team with better insight into the student population.⁸⁴

In formulating questions, team members may begin with broad questions (“focusing questions”) and proceed to developing narrower questions (“clarifying questions”) that require deeper inquiry. As shown in Figure 4.9, data teams may generate clarifying questions in response to the initial data analysis completed to answer a focusing question.

Figure 4.9: Focusing and Clarifying Questions



Source: Massachusetts Department of Elementary and Secondary Education⁸⁵

⁸² Taken verbatim from: Ibid., p. 121.

⁸³ Ibid.

⁸⁴ Ibid.

⁸⁵ Ibid., p. 122.

Frequently, the development of focusing and clarifying questions will be influenced by the data available to answer those questions. Data team members may draw from data points pertaining to demographics, perceptions, school processes, or student outcomes, as described in Figure 4.10.

Figure 4.10: Sample Data Sets

DEMOGRAPHICS	PERCEPTIONS	SCHOOL PROCESSES	STUDENT OUTCOMES
<ul style="list-style-type: none"> - Race - Gender - Special education - Grade level - Lunch status 	<ul style="list-style-type: none"> - Values - Beliefs - Perceptions teachers, parents, and students have of the learning environment 	<ul style="list-style-type: none"> - Programs - Instruction - Curriculum - Processes - Policies - Procedures - Practices 	<ul style="list-style-type: none"> - Assessments - Course grades - GPA - Teacher observations - Attendance - Dropout rate

Source: Massachusetts Department of Elementary and Secondary Education⁸⁶

Figure 4.11 describes the question formulation protocol, which lasts approximately 30 minutes. Figure 4.12 shows sample focusing and clarifying questions, each of which require data team members to examine increasingly narrow data sets.

Figure 4.11: Question Formulation Protocol

DIRECTIONS	TIME TO COMPLETION
Identify an issue in your district that you as a district data team wish to address. Write the issue on the top of a piece of chart paper. It can be formulated as a statement or question. Your issue/question should be related to student outcomes.	5 minutes
As a team, brainstorm questions that stem from the original question/statement. Write the questions as stated on the chart paper. All items must be phrased as questions. Your questions should be related to student outcomes.	15 minutes
From this group of questions, identify three questions that deal with issues that the district has control over and which, if positively resolved, will have a significant impact on teaching and learning. Out of these three, identify the top priority question. <i>Your top priority question should serve as the focusing question to initiate the Data-Driven Inquiry and Action Cycle.</i>	10 minutes

Source: Massachusetts Department of Elementary and Secondary Education⁸⁷

⁸⁶ Taken verbatim from: Ibid.

⁸⁷ Taken verbatim from: Ibid., p. 133.

Figure 4.12: Sample Focusing and Clarifying Questions

<ul style="list-style-type: none"> ■ Focusing Question #1: Are the district’s teachers utilized in the most effective and efficient manner to meet the needs of its students? <i>Potential clarifying questions:</i> <ul style="list-style-type: none"> ○ What is the ratio between special education students and special education teachers in each of the district’s schools? ○ Are the “highly qualified teachers” equitably distributed across schools in the district? ○ Are teachers assigned to classes in their area of certification? ○ Are the district’s neediest students taught by the most effective teachers? ■ Focusing Question #2: What are the characteristics and performance levels of students with high absence rates? <i>Potential clarifying questions:</i> <ul style="list-style-type: none"> ○ What is the relationship between absenteeism and performance on state assessments? ○ Which subgroups and grade levels have the highest absence rates? Lowest? ○ When does high absenteeism occur throughout the school year? ○ How does the district’s absence rate compare to the state?
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Source: Massachusetts Department of Elementary and Secondary Education⁸⁸

To develop clarifying questions, data team members and any other relevant stakeholders or consultants may engage in some basic data review as well as brainstorming. Figure 4.13 shows the activities that typically occur in a data overview meeting intended to develop focusing and/or clarifying questions.

Figure 4.13: Typical Data Overview meeting

COMPONENT	DESCRIPTION
Welcome and introductions	<ul style="list-style-type: none"> - Outline the data overview presentation so that the audience understands the purpose, structure, and outcomes of the meeting - A quick roll call or introductions so everyone knows who is in the audience, e.g., who here is a teacher, family member, or district administrator.
Purpose	<ul style="list-style-type: none"> - Clearly state the purpose for the data overview in terms of the focusing question(s) that is being explored.
Data displays	<ul style="list-style-type: none"> - Use well-developed data displays that clearly tell a story related to the focusing question(s) and stimulate constructive conversations. - Collectively make factual observations (no inferences) about each data display.
Brainstorming session	<ul style="list-style-type: none"> - Formulate hypotheses that might explain the data. - Pose clarifying questions to guide the exploration of the hypothesis. - Identify the kinds of data needed to answer the questions and suggest ways to collect the additional data.
Next steps	<ul style="list-style-type: none"> - Discuss next steps, such as action items from the meeting, e.g., who will collect additional data and by when, and the date and time of the next meeting.

Source: Massachusetts Department of Elementary and Secondary Education⁸⁹

⁸⁸ Adapted from: Ibid., pp. 124-125.

⁸⁹ Taken verbatim from: Ibid., pp. 126-127.

Figure 4.14 shows the complete brainstorming protocol that may be implemented with all stakeholders responsible for the data review. Ultimately, this process should provide “an opportunity for the target audience to collaboratively interact with the data displays associated with the focusing question.”⁹⁰ To implement this brainstorming protocol, participants should first be divided into groups of four to five individuals with one group facilitator.

Figure 4.14: Brainstorming Protocol

1. Write the focusing question on the top of a sheet of chart paper. Check to make sure each person understands the question.
2. Post the large copy of the data display (or displays) for the group to view.
3. Ask individuals to silently observe the data and record objective, factual observations about what the data say in the data display. Ensure that all have adequate time to process the information and ask clarifying questions if necessary.
4. Ask individuals to share their observations with the group. Record the observations on chart paper with the focusing question next to the display. Highlight observations that represent —problems revealed by the data.
5. On a new sheet of chart paper, the group should write the title—Hypotheses about Possible Causes. They then brainstorm hypotheses about the causes of the —problem(s) revealed by the data and record them on the chart paper.
6. As a group, then write the title—Clarifying Questions—at the top of a new sheet of chart paper.
7. Each group member should write one or more clarifying questions that stem from the —problem(s) identified by the group on a sticky note (one question per note). Place the sticky notes on the Clarifying Questions chart paper.
8. As a group, review the questions and group similar questions together if possible. Develop a title for each group such as: Questions about Achievement; Questions about Relationships among Variables; etc.
9. Reach consensus on the clarifying questions that seem most appropriate to move the inquiry deeper. Record these questions on a new piece of chart paper. Leave room between questions on the chart paper, or put each question on a separate page.
10. Under each question, identify the evidence (data elements) that needs to be collected to address each of the clarifying questions. If possible, note where each piece of data can be found and how it can be collected.
11. Share the clarifying questions and additional data elements needed with the whole group. The District Data Team will record the questions and data elements on a sheet of chart paper for the whole group to see.
12. Record the key ideas for future reference.

Source: Massachusetts Department of Elementary and Secondary Education⁹¹

Once responsible data team members or other stakeholders have gathered the data necessary to answer the clarifying questions identified in the brainstorming process, the appropriate stakeholders may review that data to answer the clarifying questions. This activity requires participants to review the new data, share observations about the data, and interpret those observations. This process, as described in Figure 4.15, lasts approximately one hour.

⁹⁰ Ibid., p. 167.

⁹¹ Adapted from: Ibid., p. 168.

Figure 4.15: Data Analysis Protocol

STEP	TIME TO COMPLETION
<p>Write the question(s) being analyzed at the top of a piece of chart paper. Check to make sure each person understands the question.</p>	<p>1-5 minutes</p>
<p>Distribute copies of the data in either graphical or numerical displays to each member of the team. Ask each person to silently observe the data by taking notes and jotting observations. By this point, the team may have three levels of data: high-level data that spurred the inquiry in the first place; data used in the data overview to generate clarifying questions; and even more specific data collected subsequently to address these clarifying questions. In some cases, the first two data sets may be fairly similar. Engaging with all data sets simultaneously can better poise the group to see patterns, trends, and outliers that had not previously been evident.</p>	<p>5 minutes</p>
<p>Observe: Ask team members to take turns (round-robin fashion) and report one of their observations. Observations should be facts or evidence that can be readily seen in the data and stated without interpretation. Instruct participants to use a sentence starter like one of the following to keep the observations factual: I see...I observe...I notice...</p> <p>After participants have shared their initial observations, probe for deeper analysis by asking a combination of the following questions:</p> <ul style="list-style-type: none"> - <i>How do data sets (or populations) compare to each other? (Such as comparing one grade to another, or school vs. district vs. state)</i> - <i>What are the commonalities among a given data set (or population)? (Such as among students who are scoring below standard, or those who are achieving)</i> - <i>What patterns or similarities are evident across different data sets? (Such as comparing local formative assessment data with state assessments, or comparing student achievement with teacher attendance)</i> - <i>What inconsistencies or discrepancies (if any) are evident?</i> - <i>What is not represented in the data?</i> - <i>What questions do the data raise?</i> <p>Capture the observations in list form on the chart paper as quickly as possible and without comment. Capture questions on a separate sheet. Continue until all team members have reported all of their observations. During this step, it is acceptable for team members to make observations based on those made by others in the group. Allow the process to proceed as long as logical and factual 20 observations can be made. It is often helpful to make a very distinct transition from the observation stage to the interpretation stage, clarifying when the group can begin to allow statements that may not be factually based.</p>	<p>15 minutes</p>
<p>Interpret: Ask each team member to review the entire list of observations. Working together, code (or group) the observations into categories. To facilitate this process, ask questions such as:</p> <ul style="list-style-type: none"> - <i>What assumptions might be underneath what we are noticing in the data?</i> - <i>What clues help explain why a certain population is meeting or missing targets?</i> - <i>What areas in the data stand out as needing further explanation?</i> - <i>What patterns or themes do we see in our observations?</i> - <i>Which of these observations are most relevant and important to our inquiry?</i> - <i>Based on our observations, what do we know now?</i> 	<p>20 minutes</p>
<p>Extend: On a new piece of chart paper, write —New Questions and Conclusions. Work as a group to identify new questions that this analysis has raised and any possible conclusions that have been identified. The questions may serve as the basis for another round of analysis, so it may be helpful to conclude by prioritizing them. Any conclusions will become the basis for subsequent action.</p>	<p>10 minutes</p>

Source: Massachusetts Department of Elementary and Secondary Education⁹²

⁹² Adapted from: Ibid., pp. 201-202.

Following the data analysis protocol, data team members and other stakeholders may engage in a range of activities to respond to the findings from the data analysis. For instance, team members may engage in a root cause analysis, develop a problem investigation plan, conduct additional research, or craft a plan for taking action on an issue. Figure A.1 in the appendix presents condensed checklists for each stage in the cycle of inquiry.

APPENDIX

Figure A.1: Cycle of Inquiry Checklists

Getting Ready

Incomplete

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Vision for Data Use	Rating:
The district has a vision for data use that aligns with and furthers the wider district mission and vision.	
The district's vision for data use is widely understood and accepted by all stakeholders.	
The vision is supported by district policies and published expectations that support the use of inquiry and data for instructional, school, and district improvement.	
Practice Average:	

District Data Team	Rating:
The district has an established District Data Team or has designated another team to fulfill those functions.	
The District Data Team has a data champion, a data manager, and additional members with the range of skills and perspectives needed to address the functions of the Team.	
The District Data Team has a clear sense of its purpose and role in furthering the district's vision for data use.	
The District Data Team has a written plan that outlines the membership, roles, and responsibilities of the Team, and this is publically communicated.	
The District Data Team uses effective team practices (starting and ending on time, appointing a moderator, following an agenda, appointing a note-taker, and clearly communicating regular meeting times).	
The District Data Team accomplishes its tasks effectively (action items are clearly noted with the people responsible and timelines for completion; Team communicates with all stakeholders).	
Practice Average:	

Assessment Literacy	Rating:
District Data Team members are fully fluent in and have a shared understanding of contemporary, standards-based assessment terms and concepts, e.g., summative assessments, formative assessments, performance levels.	
District Data Team members know what assessments are in use in the district and understand each assessment's purpose.	
Members of the District Data Team actively support the development of assessment literacy in district colleagues, school data teams, and others through professional development offerings, coaching, and modeling.	
Practice Average:	

Data Technology(ies)	Rating:
Resources, e.g., user manuals, job aids, IT support, for data technology(ies) exist and are easily accessible to district and school users.	
The district has technology(ies) for collecting and combining data from multiple sources, e.g., demographics, grades, assessment data, attendance.	
Practice Average:	

Data Inventory	Rating:
The district has a comprehensive inventory of demographic, assessment, and other data available to inform improvement plans and instructional practices.	
The data inventory is published and available to all, along with a regularly updated schedule to communicate how and when each type of data becomes available.	
Practice Average:	

Data Collection	Rating:
The District Data Team solicits feedback from stakeholders to identify opportunities for improvement in methods of data collection, management, and reporting.	
The District Data Team regularly uses established methods of communicating and coordinating with stakeholders at all levels regarding data work.	
Protocols or procedures are regularly used to ensure accuracy of data.	
The District Data Team collects and reviews data from non-electronic sources, such as <i>Learning Walkthroughs</i> , Common Planning Time (CPT) Self-Assessment, and interviews with principals and other staff.	
Practice Average:	

Data Access	Rating:
The district has clear policies for data access that conform to state and federal requirements.	
The District Data Team has knowledge of what data reports are disseminated to which stakeholders, when, why, and what actions are taken as a result.	
Practice Average:	

Change Management	Rating:
District Data Team members are able to identify and address potential resistance to change before problems occur.	
Practice Average:	

Inquiry **Incomplete**

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Question Formulation	Rating:
The District Data Team clearly articulates a focusing question to guide the inquiry process.	
When determining a focus for the inquiry process, the District Data Team considers high-level data and also solicits input from school and district leaders and other stakeholders regarding areas of priority concern, e.g., dropout rates, programs to evaluate.	
Practice Average:	

Data Displays	Rating:
The IT staff and District Data Team create user-friendly data displays (charts, tables, and reports) that facilitate meaningful conversations and promote new insights on the work of the district in service of teaching and learning.	
Practice Average:	

Data Overviews	Rating:
The District Data Team creates effective data overviews (presentations to an audience) that are tied to identified questions.	
The District Data Team presents data overviews to appropriate audiences to introduce stakeholders to the inquiry process.	
Data overviews engage stakeholders in discussions of high-level data and solicit their input on the formation of the questions that will guide the inquiry process.	
Data overviews result in collaborative discussions about the meaning of the data, clarifying questions to focus the inquiry, and a list of data potentially needed to address the questions.	
Practice Average:	

Priority Identification	Rating:
The District Data Team prioritizes among identified areas of need arising from the inquiry process.	
The District Data Team examines new initiatives and priorities in the context of available resources and ongoing initiatives to ensure alignment.	
Practice Average:	

Information

Incomplete

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Data Collection Planning

Rating:

The District Data Team has a system to identify who will gather and organize data needed for analysis (related to the specific focusing and clarifying questions), by when, and from where.	
Practice Average:	

Data Analysis

Rating:

The District Data Team understands the differences between factual observations and inferences generated from analyzing data and is rigorous about distinguishing between the two when discussing evidence.	
Assessment data are analyzed in aggregate and disaggregate formats.	
Assessment data is triangulated with other data, e.g., attendance, benchmark assessments, demographics, data from <i>Learning Walkthroughs</i> , stakeholder surveys, or central office processes.	
Data analysis at the district level is conducted collaboratively within and among departmental teams.	
Data analysis results in the identification of specific problems or questions that need to be addressed, e.g., problems at the student level, classroom level, school level, or district level.	
Practice Average:	

Knowledge

Incomplete

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Root Cause Identification

Rating:

District Data Team members know and implement multiple protocols for the safe discussion of root causes.	
Root cause analysis helps the Team decide on the one potential factor that, if addressed, would eliminate or dramatically alleviate the problem.	
Practice Average:	

Connections to Research and Local Knowledge

Potential root causes and proposed solutions are investigated through the consultation of research to construct strong inferences about possible solutions/action steps.	
Potential root causes and proposed solutions are also investigated through the consultation of local knowledge or expertise to construct strong inferences about possible solutions/action steps.	
Potential root causes and proposed solutions are also investigated through the consultation of information on programs and practices (including data on instruction) to construct strong inferences about possible solutions/action steps.	
Practice Average:	

Shared Knowledge Base

Rating:

The District Data Team keeps and references a problem log or meeting records documenting questions raised to guide further inquiry.	
The District Data Team encourages collection, dissemination, and active use of one or more forms of documentation of lessons learned and promising practices from improvement efforts in a library of local knowledge.	
Practice Average:	

Action

Incomplete

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Action Planning

Rating:

The District Data Team uses a theory of action to focus action planning efforts.	
The District Data Team uses a defined process for action plan development.	
The action planning process considers ways to refine or reallocate existing resources, structures, and initiatives before proposing brand new ones.	
Action plans identify the available resources necessary to carry out the action steps.	
The district can justify to stakeholders how it uses resources to achieve desired outcomes.	
District personnel can articulate the district's program goals.	
District personnel can articulate their role in achieving program goals.	
Practice Average:	

Results

Incomplete

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Evaluating Results

Rating:

District personnel have had formal training in program evaluation.	
The district evaluates the efficacy and impact of programs based on student outcomes.	
The district uses a defined process to evaluate programs and initiatives.	
The district's evaluation plans include intermediate and long-term outcomes.	
The district consults its evaluation plans throughout the year.	
The district makes mid-course adjustments to the action plan as necessary, based on formative/progress data.	
The district typically achieves its program goals.	
Practice Average:	

Communicating Results

Rating:

The District Data Team has a process and tools for communicating interim and summative results to stakeholders.	
The district uses the results of program evaluations to inform the development of new programs.	
The district has a process for codifying best practices at the district, school, or classroom level.	
The process for communicating results creates opportunities to solicit feedback to inform the development of new focusing questions.	
Practice Average:	

Source: Massachusetts Department of Elementary and Secondary Education⁹³

⁹³ Ibid., pp. 5-11.

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