

Understanding Data as Information

What is data?

Data is factual information. Educators use data to set goals and determine if they have reached a goal. Most of the time, the goal of using educational data is to improve student learning and the education system.



Data Can Help Groups Make Decisions

Using data allows you to make decisions based on facts, not guesswork or feelings. This process is sometimes called data-based decision making. Most groups will, at some point, collect or look at data. It is important to understand a few basic ideas about data.

Data Must be Reliable and Valid

Reliable means the data is accurate and true every time. Would it be the same if someone else collected the data?

Valid means the data reflects a truth and produces the desired result. In other words, does the data measure what it claims to measure?

Data also needs to be **accessible**. What does someone do when the data is not clear or hard to understand? All concerns, needs, and abilities of the audience need to be considered when using data.

Data for Families and Children

Public data related to families and children can be found in many places including your school district, city, county, regional, and national websites. Here are some examples of places to find general data.

- **WISEdash Public Portal**
<https://wisedash.dpi.wi.gov/>
- **Introduction to WISEdash Video**
<https://www.youtube.com/watch?v=c5HicpvXoGI>
- **NCES Kids' Zone**
<https://nces.ed.gov/nceskids/tools/>
- **Facts About Your Community**
<https://www.census.gov/>
- **Data About Children in Your State**
<https://datacenter.kidscount.org/>
- **State Education Data Profiles**
<https://www.nationsreportcard.gov/profiles/stateprofile>
- **School District Performance Reports**
<https://apps2.dpi.wi.gov/reportcards/>
- **REL Midwest**
<https://ies.ed.gov/ncee/edlabs/regions/midwest/>

Did you know?

WISEdash provides information on what we want our children in Wisconsin to know and be able to do, how students are performing each year, and how our schools are staffed and funded.

<https://wisedash.dpi.wi.gov/>

Confidentiality With Data

Confidentiality is a set of rules or a promise that a person makes to limit access or put restrictions on certain types of information. When working with data as a group, it is important to always state if certain information should stay in the group and not be shared with others.

Understanding Data as Information

How can I learn about the data groups use?

Data helps families and community agencies see if progress is being made toward important outcomes. An *outcome* is something that results or happens because of an activity or process. Without data your group may not know if it is getting the results it wants.



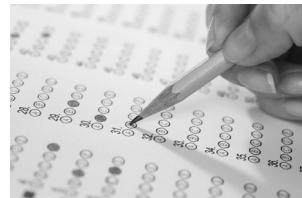
Forms of Data

There are two general forms of data. They are **quantitative** and **qualitative** data. A combination of quantitative and qualitative data often gives the best overall picture for groups looking at how to improve learning.

Quantitative = Quantity

Quantitative data is information about quantities. It can be measured and written down as numbers. It answers how much, how often, when, or where.

Examples would be things like test scores, attendance rate, and grades.



Qualitative = Quality

Qualitative data is information about qualities that describe what something is or is not like. It deals with descriptions and is data that can be observed but not measured. It answers why and how something happened. Examples are a family's story and samples of a student's work.



Key Questions to Ask

When a decision-making group uses data, ask:

- what kind of data the group uses
- where does the data come from
- how does the group use data to make informed policy decisions
- for examples of data that were collected in the past and the conclusions drawn
- for an explanation of data if you don't understand
- how the results are usually reported back to the group
- if training about data is available
- if there are some areas of data that are missing or that your group is not able to view and why

Remember...

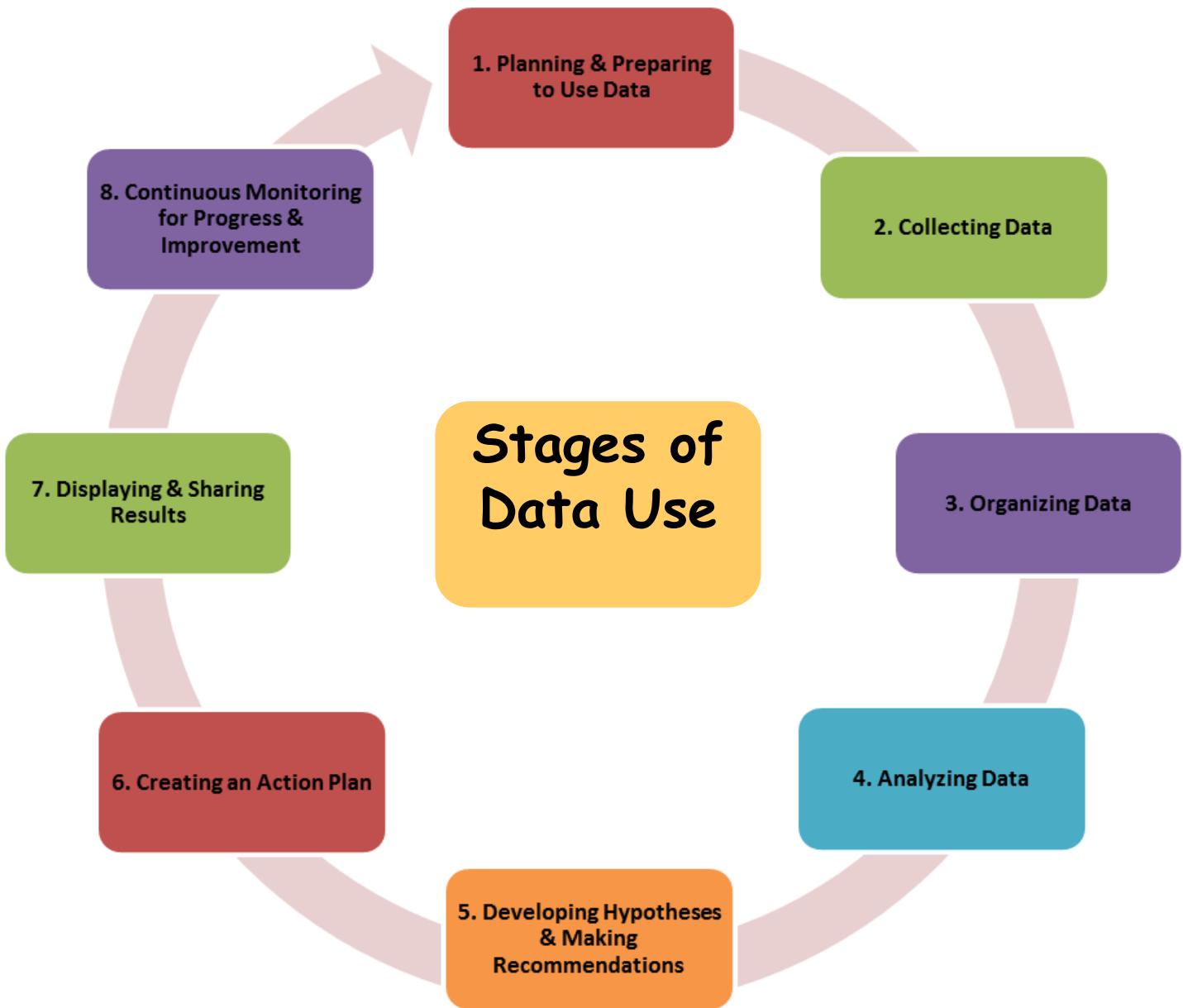
Investigating + Storytelling = Using Data

Data use includes both searching for answers to questions and storytelling. When we look at data as a group, we need to dig deeper and allow the results to have a voice and tell a story.

Understanding Data as Information

What are the stages of data use?

Using data in a decision-making group is a process with multiple steps or stages. These eight stages help make sure a decision-making group is effectively using data to inform its decisions. On pages 58 and 59 at the end of this section, there is a tool you may use to help you work through the stages of data use.



The following pages describe each of the eight stages decision-making groups are in when they use data to help make decisions and take action. At the end of each stage, there will be a **Putting It Into Action** scenario and a **Data Use Checkpoint** for greater understanding.

Understanding Data as Information

Stage 1: Planning and Preparing to Use Data

The first step in working with data is to plan and prepare by asking questions.

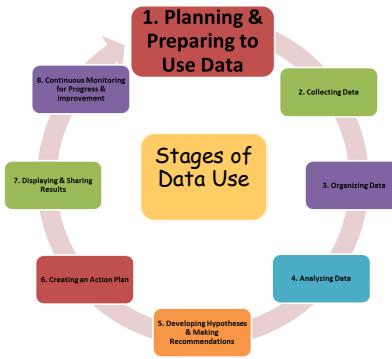
Asking Questions

The group needs to reflect and plan before the data are collected. All data planning should start with the question, "What do we want to know?" This helps to focus the data search and keeps the group on track.

Selecting or collecting data is not always about finding new data. The group needs to look at what data they already have and what data they need. More often groups spend time trying to find the right data. The group needs to be able to focus the questions so they lead the group directly to only the most helpful data.

Some Ways of Planning and Preparing to Use Data

- Ask focusing questions that help pinpoint the information that you need to provide to be able to make an informed decision and take action.
- Use a variety of methods to select data. You will want to have multiple sources of data to inform your decisions.
- Find out what data is already out there to use.
- Try to find gaps in information found in the current data.
- Pinpoint possible roadblocks in finding information and figure out how to overcome them.
- Ask school staff familiar with data to explain what the school or district knows. Have them also share areas where there is not enough data to make a hypothesis.



Other questions to ask before going to the next stage of collecting data might be:

- Why should we ask this question?
- What does the data tell us (or not tell us)?
- What will or can be done with the information that is collected?

Putting It Into Action

The school district created a committee to research why student achievement in reading wasn't improving and to make recommendations for improving. At the first meeting, John and Laura, as members of the District's Reading Improvement Committee, share their perspectives as parents of children who struggle with reading and feel school staff have low expectations of their children because they receive special education services. John has an 8th grade daughter with Down Syndrome and wonders why teaching life skills is more important than reading. He feels his daughter needs more reading instruction. Laura has a 2nd grade son with Attention Deficit Disorder with Hyperactivity and worries that because he has difficulty paying attention, conversations with teachers focus on his behavior rather than reading.

Data Use Checkpoint

By the end of Stage 1, you should have pinpointed the information you need to make an informed decision and take action.

Understanding Data as Information

Stage 2: Collecting Data

The next step in working with data is to collect it. Data should be collected for a specific reason or purpose relevant to the work of the group. Groups can collect data themselves or use data that someone else has collected.

Answering Questions to Make an Informed Decision and Act

The question a group needs to answer when collecting data is "How do I find the data -both new and existing -that I need?" Groups should only collect data they will use. Too much information can be overwhelming. Too little information won't help the group find the answers they're looking for.

Data from Schools

- **Student learning data** is about the school work and assessments of individual students.
- **Student demographic data** are the personal factors about each student.
- **School perception data** is information about the school based on views of school staff, families, and the community.
- **School process data** provide information about school management, administration, structure and general workings of the school.



Ways Schools Can Use Families as a Source of Data

- Surveys
- Focus groups
- Participants/attendees

It is important for schools to communicate to families why they are collecting data provided by families and what schools will do with the data.



Examples of Educational Data Sources

- Individual Education Programs (IEPs)
- applications & enrollment forms
- income & expense reports
- curriculum-based unit test scores
- classwork, homework, & progress reports
- parent meeting records, notes, emails, & calls
- classroom behavior charts
- attendance records & enrollment rates
- teacher to student ratios
- class sizes and available space
- state assessments & graduation rates
- demographics
- surveys & personal testimonies

Putting It Into Action

John and Laura help the team define what data to collect. To start, the team decides that they will use information from the state's WISEdash portal and district assessment data, such as screening data and formative and summative assessments. Since the district started a new reading program two years ago, data will be reviewed both before (pre) and after (post) starting the program. The *PALS* reading assessment for Kindergarten through 2nd grade will be reviewed as well as *ACT* results. Based on John and Laura's parent input, the team decides that they would like to survey families.

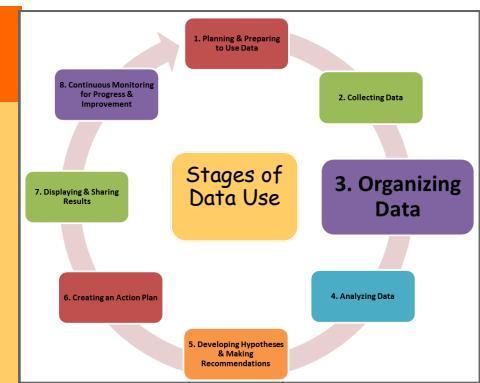
Data Use Checkpoint

By the end of Stage 2, you should have identified the data needed to answer the questions identified in Stage 1.

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Stage 3: Organizing Data

The third step in working with data is to organize it in a way that helps others to understand it. Groups may look data that is aggregated, disaggregated, and/or triangulated.

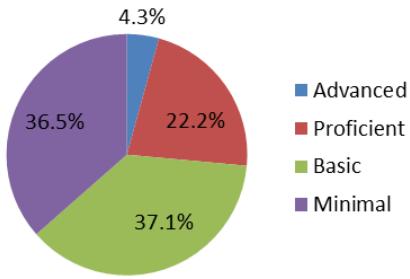


Aggregated Data

Most data is first shown as aggregated data. When you **aggregate data**, you total all the data from the whole group, giving you the big picture. For example, teachers aggregate data to get an overall picture of their classes. This "big picture" view of data is especially useful in sharing information with audiences such as your governing body. Aggregated data is also appropriate for annual reports to the public.

Aggregated Data Example:

2012-2013 District Student Reading Achievement (1079 students)



Disaggregated Data

A group may want to **disaggregate data**. This means looking at results or scores from the whole or larger group and breaking it down into smaller groups to get more and more details.

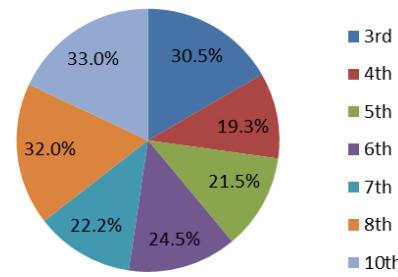
When you disaggregate data, you can dig deeper and deeper. You can disaggregate district-wide data by school, school data by grade, grade-level data by classroom, and classroom data by child.

You can disaggregate five-year data by year, yearly data by month, and monthly data by week. Each time, you get a better look of one part of data.

Sometimes disaggregated data can surprise you. Disaggregated data can help you decide on and prioritize your action plans.

Disaggregated Data Example:

Percentage of Students Scoring Proficient or Advanced (2012-2013)



Triangulated Data

Triangulated data means that the group looks at, or compares, three or more different sources of data that applies to the same person, place, object, or subject. They do this to see if the information from one source is supported by other sources. Comparing data from different sources also can provide insights.

For example, a college admission process wants to see the whole picture of the student. This includes not just the grade point average from high school but also listing the volunteer and extracurricular activities, an essay, application form, references, interview, etc.

Understanding Data as Information

Ways Data is Organized

There are still more ways of organizing data to make it easier to understand. Formats like lists, tables, charts, spreadsheets, and written and verbal descriptions help you see a visual representation of data.



How Do You Choose?

Data is organized for different purposes. Finding the right way to show data should depend on both your audience and the data you're trying to present. Some of the ways to organize data are to show:

- A Snapshot in Time
- Comparisons
- Trends

Tips for Interpreting All Graphs

Read all of the labels on the presented graph or table, paying attention to:

- What is in each column?
- What is in each row?
- What is the *range of values*?
- Does the data have a direct or indirect relationship?
- Do the lines have positive or negative slopes?
- Where was there the most change or growth?
- Where was there the least?

A Snapshot in Time

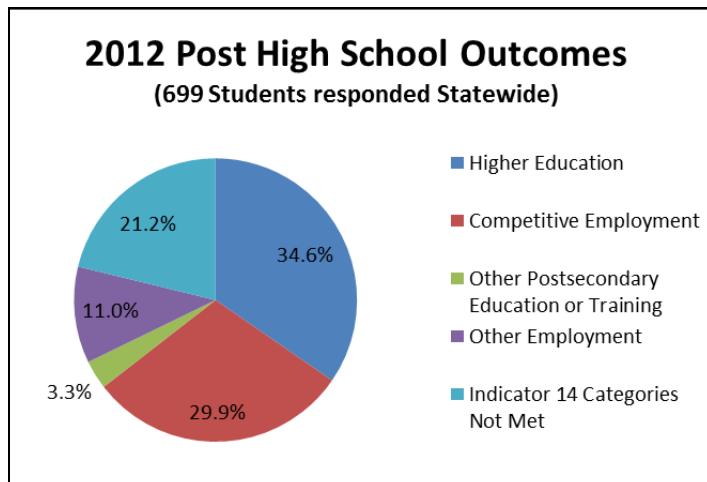
All data is a snapshot in time. For example, a *pie chart* shows a snapshot in time. A pie chart shows information by dividing a circle into several parts and showing how each part relates to the whole. There always needs to have a total of 100% when using pie charts.

Pie Chart Example

For example, a community member wants to find out what students with IEPs are doing after they graduate from high school. One way to locate this information is to go to Wisconsin Post School Outcomes website at:

<https://www.indicator14wi.org/>

A report will appear that contains all kinds of data. The pie chart below shows what students who had IEPs are doing one year after graduation from high school.



REFLECT- Refer to the pie chart above to answer the following questions.

What is the percentage of students who are in each of the following groups?

Higher Education _____
Competitive Employment _____

* Answers available on page 57.

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Comparisons

Using a bar graph or a line graph can help us compare the relationship between several variables. Variables may be the grade level, gender, English Language Learner, or other categories. Studying this data can help draw conclusions about student achievement.

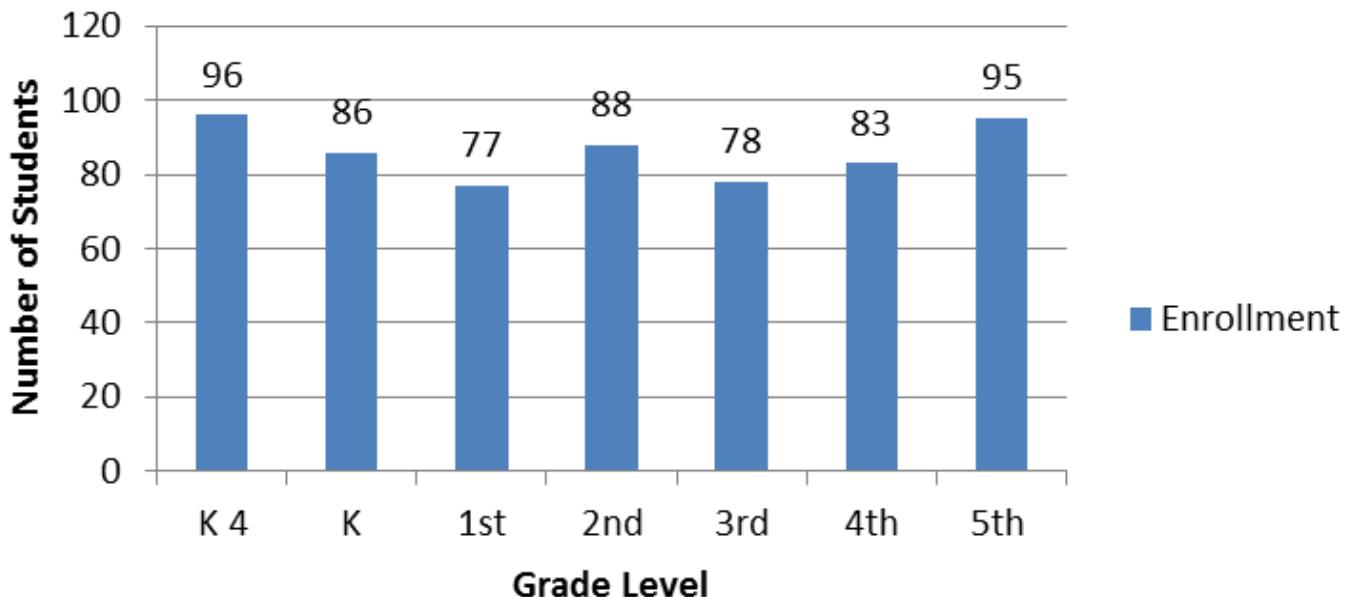


Bar Graph Example

This bar graph displays the elementary school's total student enrollment during the 2012-2013 school year. The graph tells us how the 603 students are distributed across the seven grade levels, from K4 through 5th grade. This information helps to guide decisions on the number of teachers and other staff needed in a particular grade level. For example: Class size policies are present in most school districts. If the class size policy states that 4K and K classes will have a range of 18 to 22 students per class, we would see 4 classrooms of 19 students and one classroom of 20 students in 4K this year. The Kindergarten would have 2 classes of 22 students and 2 classes with 21 students.

2012-2013 Elementary Enrollment

Total = 603 students



Reflect- Use the bar graph above to answer the questions.

How does the number of students in a grade affect the staffing needs of the school?

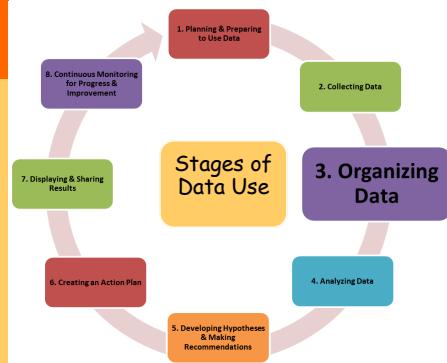
How do enrollment numbers affect instructional needs (textbooks, computers, office supplies)?

* Answers available on page 57.

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Trends

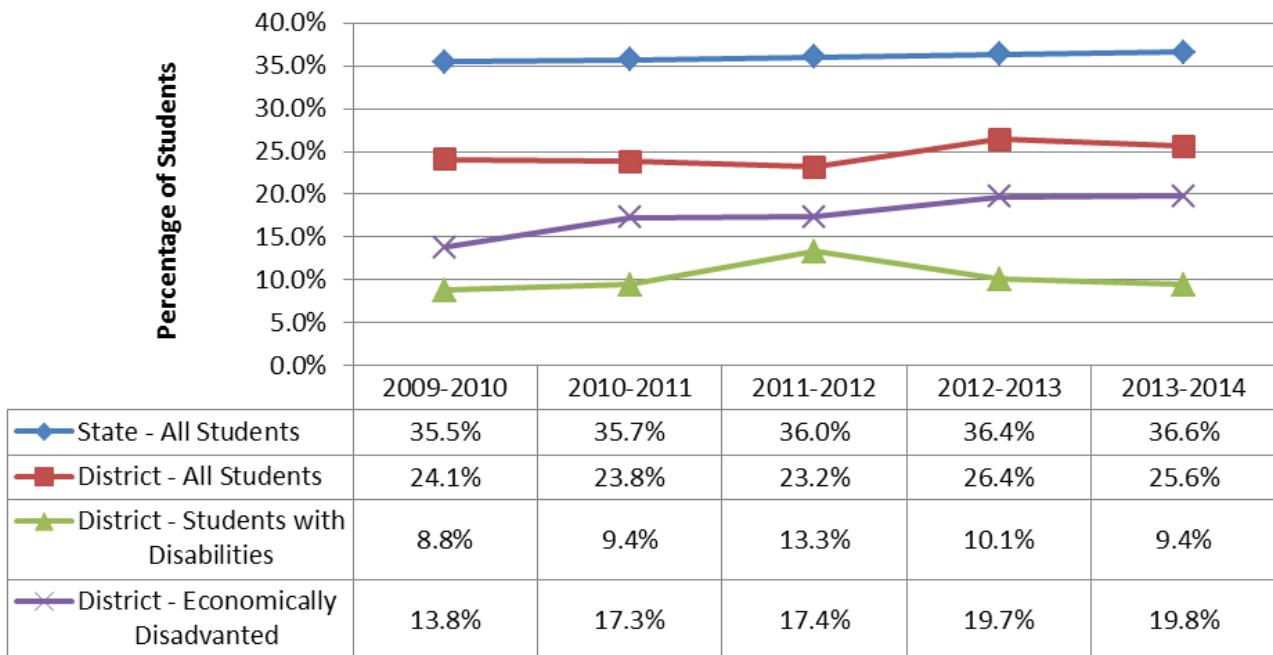
Comparing data over time helps identify trends. This can help you make predictions about the future. Using baseline data, you can track progress towards goals over time. To see achievement trends in different groups of students over time, it is helpful to use a bar graph, line graph or spreadsheet. When data from multiple years are also displayed, we begin to see trends form.



Line Graph Example

This line graph displays the Wisconsin Student Assessment System (WSAS) results in reading from the 2009-2010 school year to the 2013-2014 school year. The WSAS test includes students who took the Wisconsin Knowledge and Concepts Exam (WKCE) with and without accommodations as well as students who took the Wisconsin Alternative Assessment for Students with Disabilities (WAA-SwD). Students in Grades 3, 4, 5, 6, 7, 8, and 10 took this test.

Percentage of District Students Scoring Proficient or Advanced in Reading



Reflect— Use the line graph and spreadsheet above to answer the questions.

Which group(s) of students are improving? _____

Which group(s) of students are staying the same? _____

What do you notice about the data over time? _____

What questions do you have based on the data? _____

* Answers available on page 57.

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Validate the Findings

To validate the findings means to accept the results as accurate.



Validate the Findings

You may use the following processes to make sure your data are sound:

- Look for trusted sources
 - Follow-up with questions to make sure data is accurate and understood
 - Use many different ways of gathering data
 - Make sure the group agrees and accepts the findings

Families Ask Questions

I don't understand all of the charts
and spread sheets used at meetings.
What should I do?

"If you do not understand what is presented, ask the presenter. If that doesn't work, check with the actual source of the information. It never hurts to question the validity of the data, as well. Sometimes people use data to their advantage - to support their position. It's the beauty of data. Bottom line though, if you don't understand - ASK, ASK, ASK! There's no such thing as a dumb question!!"

-Cheri, parent

Putting It Into Action

A family survey was created by John, Laura, and two other District's Reading Improvement Committee members. Not only did they want to know how families felt right now about the reading program, but they wanted to determine if families who had children with an IEP or in the Gifted program felt differently. Other questions were included in the survey so that the team could separate different grades of students, schools, gender, and race. The team would be able to look at what all families thought about reading right now in this snapshot in time. They would also be able to compare different groups.

Another work group looked at the PALS and ACT data results over five years to see what the reading achievement trends were for students. Line graphs were used to identify trends. All of this and much more helped the team prepare for the next step - analyzing the data.

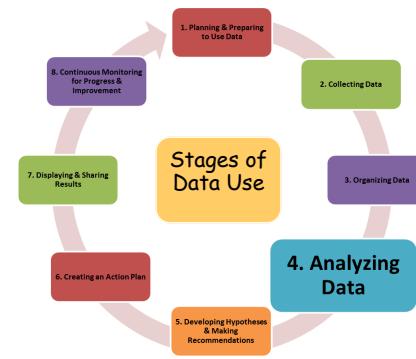
Data Use Checkpoint

By the end of Stage 3, you should have organized the collected data from Stage 2 to make it easier to understand.

Understanding Data as Information

Stage 4: Analyzing Data

After collecting and organizing the data, the next step is to analyze it. This means thinking about what the data means and finding patterns in it. Analyzing data is not a simple process and the group may have to look at the data in several ways before making a decision.



Looking for Patterns

When *analyzing data*, similarities, differences, trends, and other relationships may show information the group otherwise could not see. Each view of the data provides a unique insight, making it important to look at the data from many viewpoints. This is so the group can understand both the parts and the whole of the collected data. Only after studying the data do patterns become apparent, whether surprising, expected, or repeated.

Sometimes data is collected automatically and people ask questions about it later. For example, a school's registration form is filled out by every family in August. This information is stored in the school district's database. Official school enrollment is counted on the third Friday of September and a report is shared in October. August's registration could be compared to the enrollment data from September. The school board could sort and display the information if they want to know how many students are male, female, minorities, in a grade level, with IEPs, resident status, etc. Patterns may begin to appear by looking at the data.

Strengths and Challenges

During this step it may be possible to begin describing findings from the data as strengths and challenges. **Strengths** are results in the data that show a success. **Challenges** are results in areas where focus is needed.

Remember...

Do not draw conclusions too soon.

As you begin to review and find important data from each of the data sources, try not to come to conclusions too soon and decide on issues based on only part of a review of data. When finding and recording data, you must always remind yourself to record information as it appears in the data source, and to avoid analyzing the information too early. Only after you have collected and organized the data from all the chosen data sources will your group be ready to begin analyzing the data, developing hypotheses, and making recommendations. Decisions based on full and complete data will lead to good, long lasting actions.

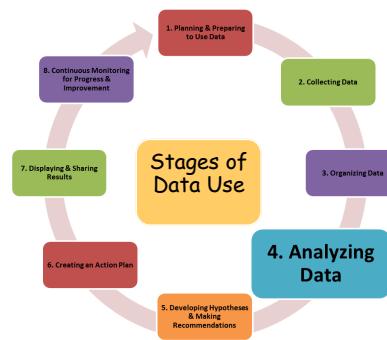
Questions to Ask When Analyzing Data:

- How was the data collected?
- When was the data collected?
- Is the data current, valid and reliable?
- What trends or patterns does the data show?
- How do results compare to the goal we set?
- Are the differences or similarities in the data something to take note of?
- What strengths or challenges arise from the data?
- What does the data tell us?

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What can help me in analyzing data?

There will be unfamiliar terms that may come up when you are analyzing data as a group. It is important to have a way of understanding those terms.

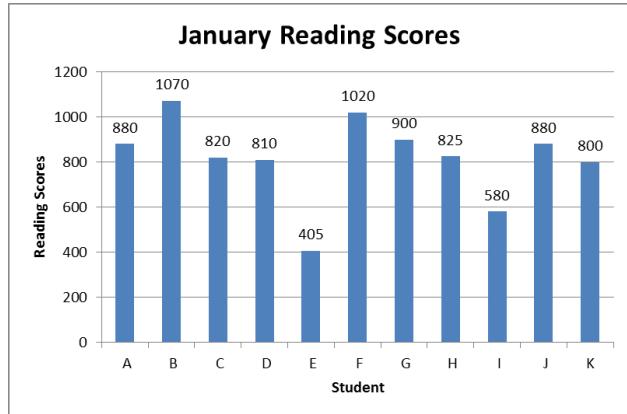


Working With Numbers

Analyzing numbers can be done a few different ways. Depending on how it is done, results can be very different. Calculating the **mean**, **median**, **mode**, and **range** for a series of numbers can help you in analyzing data, but first you have to know what the terms mean.

- **Mean** is the average of a group of numbers. It is found by adding up all the numbers, then dividing by how many numbers there are.
- **Median** is the middle value of numbers when they are ordered from smallest to largest. It is a way of showing the middle of a data sample.
- **Mode** is the most frequent value or the number that shows up the most in a data sample.
- **Range** is the difference between the lowest and highest values.

For example, Mrs. Smith checks her students' reading scores five times a year. Here is a graph showing the reading scores of her students in January. Reading scores are based on a scale of zero to 1800.

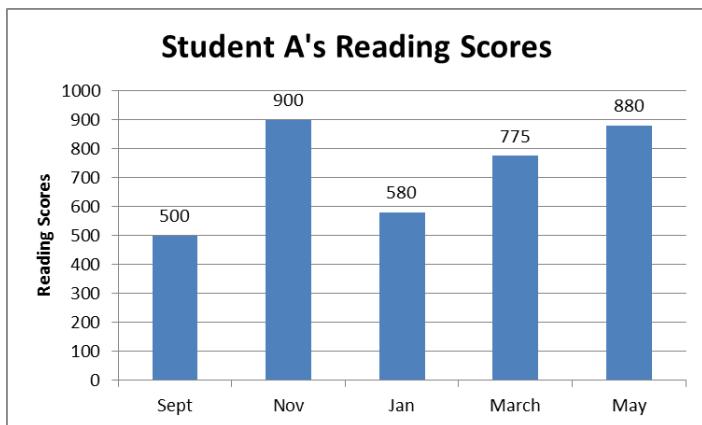


Using the data in the graph above, the Mean is figured out as 817.3, the Median is 825, the Mode is 880, and the Range is 665.

*Calculations available on page 57.

An **outlier** is either a very high or very low number in a data sample that can distort the average. It also leads to more discussion and questions.

For example, Student A's reading scores during the school year are as follows:

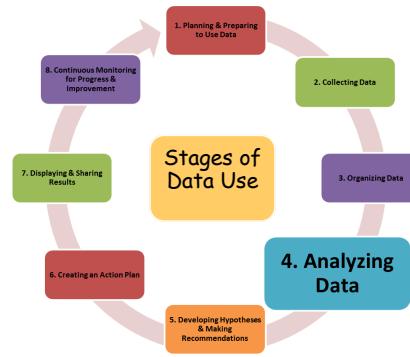


The student's second checkpoint during the school year could be considered an outlier. Student A did unusually well, scoring 400 points higher in just two months. By the time January rolled around, Student A scored lower again and then showed steady progress through the rest of the year. Was the November reading material used to test Student A an area of high interest or something familiar that he did so well? Could the dip in January be due to the student not feeling well, uninteresting testing materials, or is it exactly where the student should be? Remember each score is just a snapshot of that student's reading at that time. One just doesn't know, however what we do know is that the student made great progress during the year in reading.

Understanding Data as Information

Piecing the Data Together

Before proceeding to the next step in using data, groups will take time to check if they have enough data and the right information to make a well informed decision.



Statistically Significant

A term that may come up in discussions around data is the term statistically significant. **Statistically significant** means the data results are probably true and not because of chance.



Families Ask Questions

I don't feel qualified to make decisions. What if I don't have the education the teachers and other families do?

"You know your child best. Participating in decision making has more to do with how important the educational decisions are to you and your children than it is about the level of your own education.

You care passionately about your child's education; you will be able to make your ideas known. You are exactly the parent needed on the committee. Pick a committee that is addressing the issues you are passionate about and you will do a great job!"

-Marlea, parent

Putting It Into Action

Each workgroup prepared and presented their report by sharing the information using data charts, pie charts, bar and line graphs. John and Laura's workgroup analyzed the perception data that they collected in the family survey. Their workgroup stated that the data showed there were significant differences in reading experiences between what families of a child with an IEP report compared to families of a child without an IEP. They also noticed that there were differences between schools. They wondered if the committee might want to consider surveying teachers to see if teachers have similar viewpoints.

After reviewing each workgroup's data and findings, the committee began piecing the data together to determine if one source of data was confirmed by another source. They wanted to make sure they had enough data and the right information to begin drawing conclusions. The committee decided to also survey teachers before moving on because of the varying survey results and data they reviewed across the district.



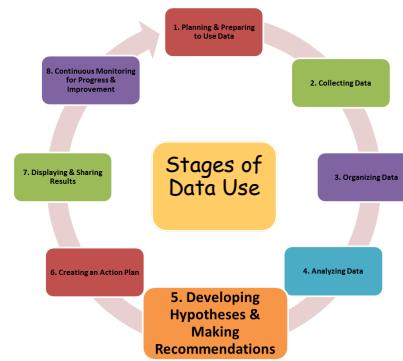
Data Use Checkpoint

By the end of Stage 4, you should have analyzed the organized data from Stage 3.

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Stage 5: Developing Hypotheses & Making Recommendations

When developing a *hypothesis*, you'll try to explain what the data represents and why it looks the way it does. Then you will decide what recommendations to make based on those hypotheses.



Developing a Hypothesis and Making Recommendations

Now that you've analyzed the data, it's time to develop a hypothesis and use what you've learned.

Data may tell you what is happening but not why. The more you analyze and understand the data, the better your conclusions and solutions are likely to be. In this stage, you will try to figure out the "why."

1. First try to understand why something might be happening by describing it. Brainstorm possible ideas based on the data.
2. Look at other data to see if these data help support your ideas or not.
3. If still not sure, ask additional questions about the data to try to determine meaning. Your questions may help clear up why something might be happening.
4. The group must agree upon the conclusions drawn from analyzing the data before recommendations are made.
5. Once you know why something is happening, you can figure out possible solutions.

Caution!

It is important to emphasize the importance of not jumping to conclusions too quickly. The group must avoid assumptions which creates a misinterpretation and misrepresentation of data.

Putting It Into Action

The committee has collected and analyzed all the data that they need and now must answer their original question about why student achievement was not improving. When comparing students in different schools, students from one elementary school consistently do worse than the other two schools' students. The family and teacher survey results from this school were very different from the other two schools. The results showed that both teachers and families had concerns about student learning and achievement in reading and the implementation of the reading program to include interventions. Teachers felt unprepared to meet the needs of the diverse student population. Families felt their children were struggling to keep up and that there was no additional help available. One committee recommendation was to look at implementation of the reading program in all elementary schools to determine what was done differently regarding: teacher training, data collection and decision-making used to identify struggling students, reading interventions (especially the interventions students with IEPs receive) and how reading achievement information is communicated to families.

Data Use Checkpoint

By the end of Stage 5, you should have developed at least one hypothesis and made at least one recommendation based on the analyzed data from Stage 4.

Understanding Data as Information

Stage 6: Creating an Action Plan

Making something happen requires creating an action plan.



Getting It Done

Groups who want to make something happen after looking at a variety of data often create an action plan. Action plans can help you improve your work and encounter less challenges. An **action plan** usually includes goals, steps, assignments, and deadlines. Some action plans will occur over a short period of time and have quick evaluations. Other action plans will take longer and may require more time to put in place.

Steps in Action Planning

1. Bring key people together to design the action plan.
2. Create an action plan made up of action steps that address all possible changes. Goals must be clearly stated. Figure out:
 - What action or change will occur
 - Who will carry it out
 - When it will take place, and for how long
 - What resources (i.e., money, staff) are needed to carry out the change
 - Communication (who should know what)
3. Review your completed action plan carefully to check if it is complete.
4. Follow through on the work by using a **timeline**.
5. Let everyone in the group know what is going on.
6. Keep track of what is happening.
7. Celebrate when action plan goals are met!

Putting It Into Action

The school board received the report from the committee and now are set to create an action plan. The following plan was created to address the reading program:

- Evaluate professional development needs of teachers and provide training and support to teachers in all schools in the reading program. Funds required. Complete by September.
- Evaluate reading interventions used by staff and if they are using the interventions the way they were trained. Provide professional development to staff members who need additional training. Evaluation will occur in Fall and a report provided to the school board in December. Training to occur in January/February.
- Attend data-based decision-making training and provide on-going coaching to leadership teams. Training completed by September. Coaching will occur quarterly and coaches will report on what support was provided.
- Review and revise school communication to families about the reading program. The School leadership team will complete review and revision by November. Families will be surveyed in March.

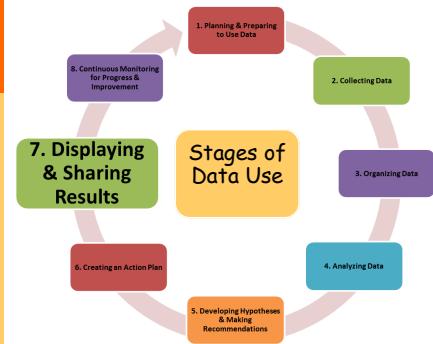
Data Use Checkpoint

By the end of Stage 6, you should have developed an action plan based on the hypotheses & recommendations from Stage 5.

Understanding Data as Information

Stage 7: Displaying & Sharing Results

When people with different perspectives look at the same data, they may make new conclusions and see ways to make changes. This is how sharing data can be useful.



Displaying Results

The group needs to present information found in the data in a way that is easy for audiences to understand.

Make sure the report is:

- **Appealing:** Keep it simple, clear, and visually attractive.
- **Accessible:** Use a reading level accessible to your audience. Avoid jargon or acronyms that the audience doesn't understand. Use bulleted lists and the language(s) spoken by the audience members.
- **Accurate:** Data must be free of errors. The report must be about what the data actually says, not what you wish the data said.
- **Audience-specific:** Focus on the issues that the audience cares about. Think about the level of detail needed by the audience and what the audience already knows.

Be Fair and Objective

Use data to drive decision making. It may be tempting to make a decision and then search only for the data that supports it. Such selective choosing of data is unethical and not useful.

Sharing Results

A lot depends on the audience when figuring out what, how, and even when to share data. Different audiences need different views of the data. As a report of the results is written, think about the following questions:

- What is the purpose of the report?
- Does it need to provide information or to raise awareness?
- Will it be used to make decisions?
- What information is new and surprising?
- What does the audience already know about the topic?
- What level of information does the audience need: the big picture or lots of details?

Be sure to share the results of your group. Decide where this data will be shared. Consider sharing data with families at:

- school board meetings
- district website and newsletter
- community newspaper
- parent group meetings

Remember...

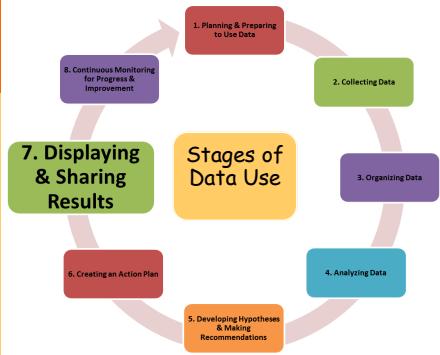
Information should be displayed in a way everyone can understand.



Understanding Data as Information

Make the Data Come Alive

Visualizing data helps to paint a picture of what the data results are all about.



Social Math

Social math is about painting a picture with data. Sometimes numbers are just numbers when the context is missing or unfamiliar. Social math is all about relating data numbers to what is familiar and concrete to your audience. It brings numbers down to earth by blending them with compelling stories and by providing comparisons with familiar things. It works by analogy.

For example, if every person in the U.S. were to change their page margins from 1.25 to .75, we would save a forest around the size of Rhode Island each year.

Social math can backfire if the story and the visual comparisons are not linked to the message you want to convey. Numbers can be presented in a memorable way but may sometimes cause the opposite reaction in your audience.

Data Stories

Data stories are being used more and more to explain and visualize information that is collected and analyzed. Behind every data example is a story just waiting to be told.

Below are strategies on telling a good story that apply to data visualizations.

- Find the compelling narrative.
 - Think about your audience and what they know about the topic.
 - Be objective and offer balance.
 - Don't censor the data in the visualization.
 - Edit and try to really explain the data.

Putting It Into Action

The committee completed their report and now members of the committee helped the Superintendent share the information with different groups. John and Laura agreed to present to family groups like the PTOs at each school.

They shared all recommendations and the data regarding the family survey results.



They were careful when sharing the school's individual family survey and student reading proficiency differences between students with IEPs and those without so as to not specifically compare schools. They used a variety of graphs to help families understand the recommendations. John and Laura answered questions and helped families understand the process the committee used.

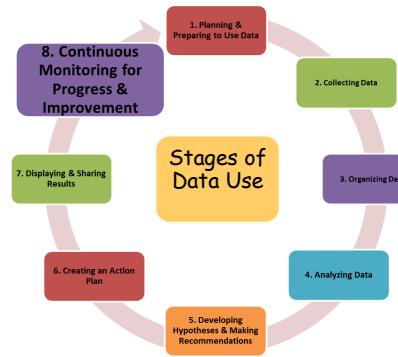
Data Use Checkpoint

By the end of Stage 7, you should have shared and displayed results based on the collected data.

Understanding Data as Information

Stage 8: Continuous Monitoring for Progress & Improvement

Dealing with data doesn't end with creating an action plan. It is only the beginning! Good data practice involves continuously collecting and evaluating data to make sure progress is made.



Check Your Work

Groups should regularly revisit the action plan which was developed as a result of data received. Group members should regularly check in with one another, identifying challenges, making changes as needed, and celebrating successes.

Evaluating the Action Plan

When checking to find out if the action plan is working, the group should collect the same type of data from the same data source used to start the data cycle. When data are gathered from different sources, differences in how the data were collected could lead to different results. For example, if a group received and used survey data from community members to make their action plan, they should again survey community members to discover if their plan is working. They should not survey students or school staff to see if their decisions are making a difference. The group can more easily compare results if the same group is surveyed twice.

The Process Begins Again

Sometimes looking at how well the action plan is working leads to new questions or the need for new data. Effective, continuous progress monitoring often addresses questions such as:

- To what extent has the initial question been answered?
- What new concerns or questions have come up?
- Which factors are clearly understood and which ones need more data?
- Has the situation improved?

The Drive to Continue

Monitoring for progress and improvement gives group members a chance to see the results of their hard work. When groups see good things happening based on their decisions, their drive to keep working at it is renewed. If things are not working as planned, the group can revisit their questions and data to adjust their plan.



Putting It Into Action

During the school year, the school board scheduled quarterly progress reports on the District Reading Improvement Action Plan. At the September meeting, the school board received the following update: 1) Due to large staff turnover, 20 teachers required reading program training. Only 10 teachers were able to attend the training in August. Ten additional teachers will be attending a training next week. 2) Leadership teams are registered to attend RtI Center trainings on the RtI system framework and data-based decision-making. The school district has decided to contract with external coaches to provide coaching support to each team.

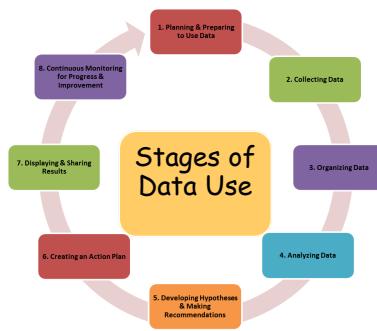
Data Use Checkpoint

By the end of Stage 8, you should have set up a system for checking that goals are being met.

Understanding Data as Information

Final Thoughts

Data is used every day by groups making decisions on behalf of students, families, and schools. When reliable data is used responsibly, it can lead to improved outcomes for all.



Summary of Stages

Using data in a decision-making group is a process with multiple steps or stages. These eight stages help make sure a decision-making group is effectively using data to inform its decisions.

Stage 1: Planning and Preparing to Use Data
Pinpoint the information you need.

Stage 2: Collecting Data
Gather new and/or already collected data.

Stage 3: Organizing Data
Help to make the data understandable.

Stage 4: Analyzing Data
Find out what the data means.

Stage 5: Developing Hypotheses and Making Recommendations
Look at the data to try to figure out why and consider possible next steps.

Stage 6: Creating an Action Plan
Make a plan to get something done.

Stage 7: Displaying and Sharing Results
Show others the data and future plans.

Stage 8: Continuous Monitoring for Progress and Improvement
Check the work to make sure things are getting better.

Tool for Using Data Handout

On pages 58-59, there is a tool people may use to help work through the stages of data use. This tool can be used individually or as a decision-making group to help in using data effectively to make informed decisions.

Answers & Calculations

Page 45:

Higher Education = 34.6%; Competitive Employment = 29.9%

Page 46: Possible answers are:

- 1) More students in one grade may impact the number of teachers needed, the amount of supervision in the classroom or playground, and when a grade level goes to lunch if there's a small lunch room.
- 2) Schools need to have more textbooks and computers available in a classroom when enrollment is high. Teachers also have to make more copies of worksheets and have more general supplies on hand.

Page 47:

- 1) Groups that are improving: State—All Students, District—All Students, and Economically Disadvantaged.

- 2) Students with Disabilities are remaining much the same.

- 3) Students who are economically disadvantaged seem to be moving closer (closing the gap) to the District—All Students percentage. The performance gap between all district students and student with disabilities seems to be getting larger.

- 4) Why are students with disabilities not as proficient in reading as other students?

Page 50:

The **Mean** is computed as follows:

$$880+1070+820+810+405+1020+900+825+580+880+880+900+1020+1070 = 8,990, \quad 8,990 / 11 = 817.3.$$

The **Median** is the middle number. In this case, we place the numbers in order:

405, 580, 800, 810, 820, 825, 880, 880, 900, 1020, 1070. The middle number is the 6th number out of 11 numbers, or 825.

The **Mode** is the number which shows up the most in the data set. In this case, 880 is present twice and is therefore the Mode.

The **Range** is the difference between the highest number and the lowest number in the data set. The highest number is 1070 and the lowest is 405. The difference is 665.

Understanding Data as Information

Tool for Using Data

Page 1

Directions: This tool can be used individually or as a decision-making group to help in using data effectively.

STAGE 1: PLANNING & PREPARING TO USE DATA (page 42)

What is your question?

STAGE 2: COLLECTING DATA (page 43)

Describe the data you used. (Example: reading scores)		Where did you find the data? (Example: WISEdash)	Data as numbers (quantitative) <input checked="" type="checkbox"/>	Data as story or opinion (qualitative) <input checked="" type="checkbox"/>
1.				
2.				
3.				
4.				

Do you have reliable and valid data? YES NO NOT SURE

Do you have all the data you need to answer your question? YES NO NOT SURE

What other types of data would be helpful? (Examples: grades, surveys, assessments)

STAGE 3: ORGANIZING DATA (pages 44-48)

How is the data organized?

Snapshot in Time Trend Comparison
 Pie Chart Bar Graph Table Line Graph
 Aggregate Disaggregate Triangulated

Comments: _____

STAGE 4: ANALYZING DATA (pages 49-51)

Are there patterns in the data? YES NO NOT SURE

What information is unclear or needs more clarification? _____

Understanding Data

Tool for Using Data

Page 2

STAGE 5: DEVELOPING HYPOTHESES & MAKING RECOMMENDATIONS (page 52)

What conclusions are made based on the data?

- 1) _____
- 2) _____
- 3) _____
- 4) _____

What other questions do you have now? _____

What will be included as recommendations for your action plan? _____

STAGE 6: CREATING AN ACTION PLAN (pages 53)

What are your goals? _____

How do you plan on achieving the goals? _____

STAGE 7: DISPLAYING & SHARING RESULTS (page 54-55)

What story does the data tell? _____

Who are you sharing the data with? (Examples: school staff, students, community members) _____

What is the response to the data? _____

STAGE 8: CONTINUOUS MONITORING FOR PROGRESS & IMPROVEMENT (page 56)

How do you plan to check how you're doing? (Example: Annually Report to Stakeholders) _____

How often will you monitor your progress and improvement? (Examples: monthly, quarterly, annually) _____

NOTES