

Diving into Data

Prepared by Jobs for the Future

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ABOUT US

Jobs for the Future (www.jff.org) works with its partners to design and drive the adoption of education and career pathways leading from college readiness to career advancement for those struggling to succeed in today's economy.

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Overview

Over the past decade, school improvement and reform strategies have incorporated the use of data at all levels: classroom, school, district, state, and national. Today, data driven instruction for continuous improvement remains a priority for school systems throughout the nation. Education Secretary Arne Duncan (2009) stated there is a “pressing need for educators to gain knowledge and skills in data use to inform practice.” As such, major education initiatives such as Race to the Top (RTTT), School Improvement Grants (SIG), and the American Recovery and Reinvestment Act (ARRA) have focused on the use of data to improve school performance.

Low-performing schools that have adopted data-driven instruction have shown remarkable student achievement and improved their trajectory in just a few years. For example, Orchard Gardens Pilot School in Boston, Massachusetts, previously one of the lowest performing schools in the state, saw unprecedented growth in student achievement. The school recently met all of its school improvement targets as a SIG school and has been designated as one of the best schools in Massachusetts.

The principal cited “[i]ntensive use of data to drive improvements in instruction and respond to individual student learning needs” as one of the four key strategies that led to this drastic progress. Students at Orchard Gardens currently have the highest academic growth rates in the state and are performing at higher levels than their peers regardless of social economic status.



[Orchard Gardens Case Study](#)

While data-driven instruction may initially sound cold and impersonal, many of the strategies, particularly at the classroom level, are actually quite student-centric. Through techniques such as data walls, student conferences, and goal setting, data analysis can lead to a dynamic exchange of conversation and ideas between the teacher and student as they work together to set mutual goals and improve achievement.

With data-driven instruction, individual teachers, or teams of teachers, can use data to:

- 1) Inform student instructional progress and needs,
- 2) Engage and motivate students by encouraging them to track their own progress, and
- 3) Empower students to take responsibility for their progress and to set and meet academic objectives.

Purpose of This Toolkit

The Diving into Data Toolkit will provide classroom strategies for using data to enhance student achievement. Practitioners will learn to:

- use data cycles to improve instruction,
- create data walls to motivate students, and

- incorporate data in student conferences and goal-setting activities.

We will also look at examples and best practices from secondary schools that have leveraged data-driven strategies to dramatically improve student outcomes.

Who Should Use This Toolkit

This toolkit is designed for classroom teachers and other educators in underperforming urban or rural high schools interested in using data as one strategy for school improvement. The strategies will be appropriate for all classroom teachers, not just those who teach courses that are subject to standardized testing.

While the templates shared in the toolkit demonstrate how practitioners can use data to inform their practice at the classroom level, they can be modified to fit the needs of the school and the district.

How to Use This Toolkit

The toolkit begins with an overview of the Family Educational Rights and Privacy Act, an important legal consideration when using data. Practitioners should review and familiarize themselves with student confidentiality requirements before implementing the strategies in the toolkit.

The second part of the toolkit provides information and tools for analyzing data using the Data Cycle model. It also provides a sample agenda for using the Data Cycle in grade or content-level meetings.

The toolkit concludes with strategies and best practices for encouraging student engagement and motivation through the use of data, including data walls, student conferencing, and student goal setting.

Family Educational Rights and Privacy Act (FERPA)

As you work with student-level data and implement the strategies outlined in this toolkit, you must protect your students' legal rights to the privacy of their educational data under the FERPA.

In basic terms, FERPA protects a student's educational data by limiting access to authorized education officials, parents, guardians, and, in some cases, students. Data can only be released to other individuals (e.g., school community, afterschool providers, tutors) if a parent or guardian gives consent.

As a practitioner, if you plan to use data-driven instruction, such as data walls or data cycles, you must have a practical understanding of how FERPA applies to the collection, storage, and sharing of student information. For example, when tracking student progress using data walls, student names or other identifying information cannot be included on the display.

Here are some FERPA guidelines to keep in mind.

DOs

- Familiarize yourself with the types of data your district considers confidential before sharing any student data publicly.
- When posting confidential information on data walls, use markers or other tools to mask the students' identities.
- Conduct student conferences that include discussions of confidential data in a private setting away from other students.

DON'Ts

- Never use names when displaying confidential student data publicly.
- When creating data walls, do not use markers that can be traced back to individual students.
- Do not share confidential data with community partners unless consent forms have been signed.

Data Security Reminders

- Store confidential paper files in a locked drawer or cabinet.
- Protect digital files that contain confidential data with a strong password.
- Check your district's policies on where to save and store spreadsheets and data. For instance, some districts do not allow confidential data to be saved to common "cloud" applications.
- Some states and districts prohibit emailing of confidential data, so review your district's policies.

Teachers and administrators may learn more about FERPA legislation and requirements and find useful resources here: <http://www2.ed.gov/policy/gen/guid/fpco/index.html>.

Improving Instruction with Data Cycles

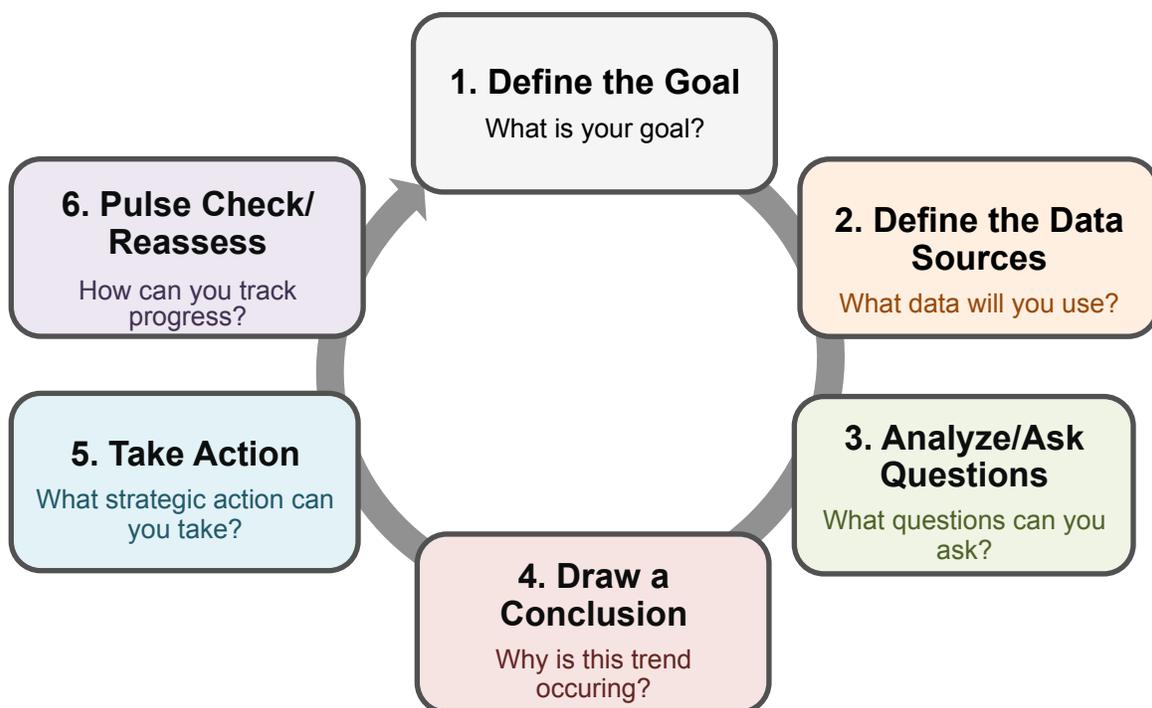
Schools now collect and analyze more data than ever to monitor academic progress and strategically plan interventions. As you move toward data-driven instruction, you may feel overwhelmed by the amount of information available.

Data cycles are a great starting point, providing a step-by-step process for data analysis that helps you make informed instructional decisions. By identifying the root causes of instructional challenges, data cycles assist in developing interventions and strategies aligned with a school's academic focus.

The data cycle is applicable to any type or level of education data including:

- state assessments
- interim assessments
- scoring rubrics
- homework
- attendance and behavior

The data cycle consists of six continuous steps:



“To improve instruction, schools should use data to set goals for instructional improvement, make changes designed to immediately and directly affect instruction, and continuously reassess student learning and instructional practices.”

– *Doing What Works, Research-Based Education Practices Online*

Tool: Mapping the Data Cycle

Purpose: To provide a structured approach for conducting a data cycle to improve instruction.

How to Use:

1. Review the sample template below to better understand each step in the data cycle. Sample responses are italicized.
2. Use the Data Cycle Template to plan each step of the cycle with classroom-level data.

SAMPLE DATA CYCLE TEMPLATE	
Step 1: Define the Goal. Define the instructional goal you are trying to achieve. The goal provides a specific target to reach and helps you align the strategies within the cycle.	
Ask yourself:	
<ul style="list-style-type: none">• What is the goal?• How is this goal aligned with your school improvement goals?	
<i>Our goal is to increase proficiency on the state assessment in English Language Arts (ELA) by five percentage points annually. This goal is aligned with our school's focus on core language and math skills.</i>	
Step 2: Define the Data Source. Define the data source you will use to reach the goal. Make sure you know the frequency of data availability; consider other sources for additional information.	
Ask yourself:	
<ul style="list-style-type: none">• What is your primary data source? Are there additional sources?• How frequently is the data released or updated?	
<i>State assessment data. The data is released one time per year, usually in the summer/fall prior to the start of the school year.</i>	

Step 3: Analyze and Ask Questions. Identify trends in the data by asking “big picture” and “dive deeper” questions.

Ask yourself:

- What questions do you have about the data (big picture and dive deeper)?
- What trends are you noticing?
- Based on your knowledge of the data and/or students, do you have any insight about what the data shows?
- Are there concerns with data sources, timing, or frequency?

Students are struggling on the vocabulary standard on the ELA assessment. For the last several years, the scores on that standard have been significantly lower than the other ELA standards.

Questions to consider:

- *How are we teaching this standard?*
- *Are some English classes outperforming others? If so, why?*

Step 4: Draw a Conclusion. Draw a conclusion as to why the trends are occurring. The conclusion helps you determine the root cause of the issue.

Ask yourself:

- Based on the analysis, what is the underlying issue?

Since this trend started with the adoption of the current ELA curriculum, the curriculum either does not place enough emphasis on vocabulary development or it needs to be taught differently.

Step 5: Take Action. Take strategic actions that address the cause identified in your conclusion.

Ask yourself:

- What are some possible action steps you can take now?
- Which step will have the biggest impact?

We will implement a supplementary curriculum (Word Generation) that focuses on vocabulary development. Additionally, we will examine and share relevant teaching strategies used in classes with higher vocabulary scores.

Step 6: Pulse Check/Reassess. Assess the effectiveness of the strategic action using either a pulse check or reassessment. A pulse check is a very quick way to check progress to see if students are on track. A reassessment is a more formal and comprehensive way of checking progress.

Ask yourself:

- How will you conduct pulse checks?
- What comprehensive check will you implement?

Pulse Check: Teachers will administer “exit tickets” to check for understanding after their daily Word Generation lessons. Exit tickets are brief prompts or questions that often ask students to summarize what they have learned. Teachers can use student responses to quickly identify the topics that students struggle with.

Reassess: Teachers will analyze the vocabulary standard in the interim assessment to track progress toward the goal. The final reassessment will focus on next year’s vocabulary standard on the state assessment.

DATA CYCLE TEMPLATE

Step 1: Define the Goal. Define the instructional goal you are trying to achieve. The goal provides a specific target to reach and helps you align the strategies within the cycle.

Ask yourself:

- What is the goal?
- How is this goal aligned with your school improvement goals?

Step 2: Define the Data Sources. Define the data sources you will use to reach the goal. Make sure you know the frequency of the data; consider other sources for additional information.

Ask yourself:

- What is your primary data source? Are there additional sources?
- How frequently is the data released or updated?

Step 3: Analyze and Ask Questions. Identify trends in the data by asking big picture and dive deeper questions.

Ask yourself:

- What questions do you have about the data (big picture and dive deeper)?
- What trends are you seeing?
- Do you have any insight into the data based on your knowledge of the data and/or students?

Step 4: Draw a Conclusion. Draw a conclusion as to why the trends are occurring. The conclusion helps you determine the root cause of the issue.

Ask yourself:

- Based on the analysis, what is the underlying issue?

Step 5: Take Action. Take strategic actions that address the identified cause.

Ask yourself:

- What are some possible action steps you can take now?
- Which one will have the biggest impact?

Step 6: Pulse Check/Reassess. Assess the effectiveness of the strategic action using either a pulse check or reassessment. A pulse check is a very quick way to check progress to see if students are on track. A reassessment is a more formal and comprehensive way of checking progress.

Ask yourself:

- How will you conduct pulse checks?
- What comprehensive check will you implement?

Incorporating the Data Cycle into Grade Level/Content Meeting

Data cycles can also be used to analyze data across subjects or grades. For instance, grade-level teams might conduct a data cycle on improved attendance, while content-level teams might focus on improved scores on unit tests or grading rubrics.

While the Data Cycle Template can be used with groups, you will want to plan ahead to assign roles, prepare data, and develop an agenda to keep the meeting on track.

Prior to the Meeting

Prior to the meeting, each member is assigned a role:

- Facilitator: conducts the meeting
- Time Keeper: ensures the team is on track and using time effectively
- Note Taker: takes notes for the team
- Data Analyst: prepares data for the meeting

Data Analyst Preparation

Prior to the meeting, the data analyst should:

- determine the **goal** the team will focus on during the meeting,

- prepare the **data sources** in a clear format that can easily be analyzed by the team, and
- compile a few key questions that apply to the data set.

Tool: Data Cycle Team Meeting Agenda

Purpose: To provide a framework for incorporating the data cycle into a grade-level or department-level meeting.

Sample Framework/Structure (60 minutes)		
Goal	Review the goal.	2 min.
Data Source	<ul style="list-style-type: none"> • Review the data set—why was this data set chosen? • How does this data align with the school/grade/content goals? • Familiarize the group with the data. 	5 min.
Analyze/Ask Questions	<p>Consider the following questions. Modify and add questions based on the data set.</p> <p>Big picture questions:</p> <ul style="list-style-type: none"> • How well is the class doing in comparison to their grade-level peers or other students in the school? • Are students close to the goal? • What are the areas of strengths and weaknesses? • Which students did well and which did not? <p>Dive deeper questions:</p> <ul style="list-style-type: none"> • Are students doing better on certain types of assignments or assessments? • Did many students choose the same incorrect answer on an assessment? <i>Why?</i> • What anomalies do you notice? (Example: students scoring low on open-ended questions.) • Does one gap area influence another? 	15 min.

Draw a Conclusion	<p>Why are these trends occurring?</p> <p>What are the underlying factors beneath the issue?</p>	5 min.
Strategic Action	<p>What specific action steps can we take to address the identified conclusion?</p> <p>Which steps can we take immediately?</p>	10 min.
Pulse Check/ Reassess	<p>How will we check progress?</p>	10 min.
Review/ Next Steps	<p>Review/Next Steps</p>	5 min.

Engaging Students with Data Walls

Data can also be used to encourage student engagement through data walls. Data walls visually present data about a specific question or problem, allowing educators to communicate results and involve students in school-wide and classroom goals.

The data wall can show the progress of an individual student, or track progress at the student, classroom, grade, or school level. Well-designed data walls ensure students know the classroom or school improvement goals and provide a path for students to reach those goals.

Data walls are one way to communicate goals and priorities to the school community. Track only the highest priority goals (or leading indicators) for your school, grade level, or classroom.

Since data walls illustrate the starting point and track progress toward the goal over time, the strategy is most effective if the data is regularly updated so students can visualize their progress toward the goal.

FERPA Reminder: When working with student-level data, teachers should use markers, symbols, or numbers linked to the student, instead of names. For instance, students may be assigned specific colors to track their progress. Each student knows their own colored dot, but it is not identifiable to other students.



Post-It notes show progress toward each goal by indicator.

This data wall from Citizen Schools tracks several leading indicators by class teams. The teams, named for area colleges, are labeled in the columns while rows show the data for specific indicators, such as homework or attendance.

The goal for each indicator is prominently displayed. Post-It notes are used, making the chart very easy to update as teams progress toward the goal.

The chart is prominently displayed in the school's hallway so that students can track their team's progress.

What if the data is not frequently updated?

In some cases, a leading indicator of the goal, rather than the goal itself, will be tracked. Leading indicators help to assess progress toward goals when the data is available infrequently. For instance, interim assessment data, which is considered a leading indicator

of progress on the state assessment, would be more beneficial to track than the actual state assessment data since interim assessments are administered more frequently.

The image on the right is from [Making Data Public](#), which contains numerous visual examples of well-constructed, highly successful data walls.

Individual student GPAs, listed by ID number.

In this example from New Mission High School in West Roxbury, Massachusetts, the data wall *Are You on Track for College?* is used to track student GPAs, a leading indicator for college success.

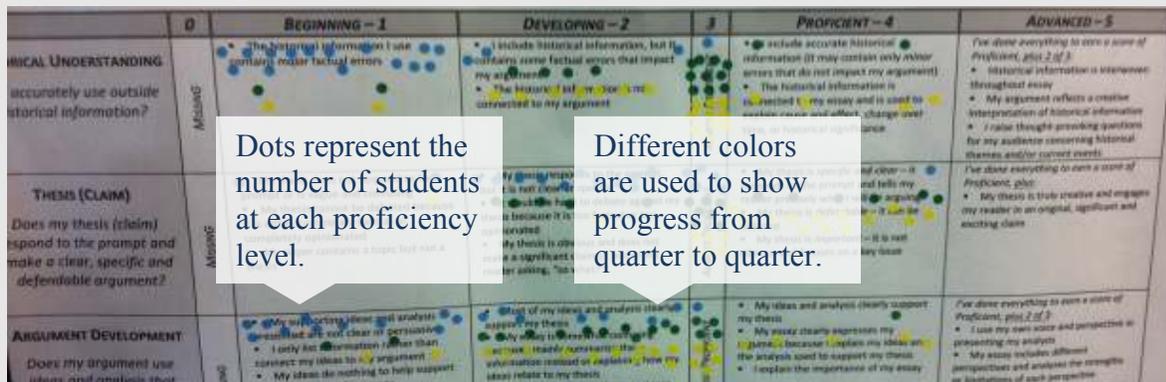
Breakdown of student GPAs for each grade level.

The teacher also emphasizes what class periods made the most growth overall.

What if I teach a subject that does not have standardized test scores to track?

Data walls are used for more than tracking standardized test scores. At Chelsea High School, in Chelsea, Massachusetts, the school has developed common rubrics through their professional learning community to track progress on essays. This rubric becomes ingrained in the students' writing over time as they strengthen the academic writing skills needed for college. The rubric below, used in tenth-grade ELA and tenth-grade history, was selected for the data wall because it is linked to college and career readiness.

Students' scores on each section of the rubric are tracked each quarter, allowing them to visually see their growth throughout the year. Each student has a marker, and different color dots are used each quarter. Data for each class is posted in the hallway, and the teacher tracks progress toward the goal through a competition among the classes.



This rubric shows the progress of one class throughout the year.



The data wall indicates which class made the most improvement over the quarter.

Photos courtesy of Jenna Goldenberg, tenth-grade history teacher at Chelsea High School

Tool: Data Wall Road Map

Purpose: To provide a step-by-step process for creating a data wall to track student progress on high-priority instructional goals.

How to Use:

1. Identify the goal and the data source (Steps 1 and 2).
2. Decide how the data will be displayed and updated (Steps 3 to 5).
3. Before creating the data wall, sketch out the data wall to ensure it meets key guidelines (Step 6).

Step One: Identify the goal. Determine the goal(s) you will track. Choose high priority goals that reflect school improvement goals or the team's priority areas. Look for data that can be linked to college- and career-readiness goals as well.

Goal(s):

Step Two: Identify the data source. Consider the availability of the data, and make sure the data is updated fairly frequently. Choose a leading indicator of the goal if the data is only available once or twice a year.

Data Source:

Step Three: Determine how data will be displayed and updated.

Select the type of data you will track:

- Student-level Data (Go to Step 3a.)
- Aggregate Data (Go to Step 3b.)
Aggregate data includes grade-level, school-level, and school-wide data.

<p>3a. If you are tracking student-level data, answer the following questions:</p> <p>What markers will you use to conceal students' identity?</p> <p>When will the data be updated?</p> <p>Who will update the wall—you or your students?</p>	<p>3b. If you are tracking aggregate data, answer the following questions:</p> <p>Are you tracking:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Grade-level data <input type="checkbox"/> Content-level data <input type="checkbox"/> School-wide data <p>When will the data be updated?</p> <p>Who will update the wall?</p> <p>How will students be grouped?</p>
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Step 4: Align data walls to school/classroom improvement strategies. A data wall is not a stand-alone strategy for school improvement, but should be connected to other improvement initiatives within the classroom or school.

Is the display located in a space that is highly visible that will engage students and the school community?

How will you encourage students to invest in the process?

Step 5: Present the Data Visually

Keep these guidelines in mind when creating your data wall:

- Show the goal on the chart so students can quickly see the target they are working toward.
- Use simple charts to illustrate the data and ensure the data can be updated easily.
- Use graphics, statements, or illustrations that will relate to your students.

Consider having students help with the design and creation of the data wall. It will provide more investment in the display and, ultimately, more student investment in the goal.

Tool: Data Wall Checklist

Purpose: To provide a checklist to use when evaluating your data wall.

How to Use: Complete this checklist to review key considerations for the public display of data. If you answer ‘No’ to any of the questions, consider how to revise the data wall.

Public Data Wall Checklist	
Considerations	Yes/No
1. Is data tracking a high priority goal/indicator for the classroom/school?	
2. Does the chart show the school/classroom target?	
3. Can the data be updated at least 3 to 4 times during the school year?	
4. Can the data wall (and markers) be updated easily?	
5. Is the data aligned to other school/classroom data strategies?	
6. Is the display highly visible and in a location that will engage students?	
7. Is the data wall current?	
8. For a student-level data wall, does the display protect the students’ right to privacy by using non-identifiable markers?	

Tips for Effective Data Walls

- Use simple charts that are easily and quickly understood by students.
- Update results as frequently and quickly as possible so students can see their progress in real-time.
- Spend less time perfecting the display and more time analyzing the data with students.
- Set aside time for you or your students to update the wall. For student-level data, use protocols to protect confidentiality if students update their own progress.

Encouraging Achievement through Student Conferences

Student conferences can help students understand the link between hard work and academic achievement, encouraging them to take responsibility for their learning progress and invest in their future. For example, a teacher can use a conference to emphasize how attendance impacted the student's progress and grade. Conferences can also be used to help students identify their own goals for the class.

Student conferences can be used separately or in conjunction with data walls. As with data walls, student conferences should focus on the highest priority goal and ensure student confidentiality.

Example: Student Conferencing on School-wide Goals

At McCormack Middle School, a low-income urban school in Boston, teachers and school partners, including City Year and Citizen Schools, conducted quarterly student conferences focused on school-wide goals.

The goals included the ABCs of dropout prevention: attendance, behavior, and coursework. Interim assessment scores were added as the fourth goal. Before the end of each quarter, students reflected on their progress and had the opportunity to complete missing work. Progress on each goal was reflected through traffic light colors—red, yellow and green—based on the school's targets for each area. During the conference, students answered these questions:

- What are you doing well? What could you improve?
- What action steps can you take? How can you get help and support?
- What is contributing to your grade? Are there assignments you could make up?
- How will each of these areas help you reach your college and career goals?
- Is your attendance affecting any of these outcomes? How can you ensure that you are present and engaged in class?

Example: Student Conferencing on Classroom Goals

Data walls and student conferencing go hand-in-hand to encourage students to invest in their academic progress. At Chelsea High School, history teachers complement their rubric-based data wall with a unique approach to student conferences.

The teachers conduct a showcase where students share an essay that reflects their progress throughout the year. Students engage with administrators, parents, and teachers one-on-one to discuss their academic progress and share their historical essays along with their quarterly scored rubrics.

Prior to the showcase, students answer the following questions:

- What specific skills have you developed this year that will help you be successful in the future?
- How did your writing improve from the beginning to the end of the year?
- How does this piece demonstrate progress toward your growth as a learner? How is your growth connected to your college and career goals?

Student Goal Setting

“When formative assessments and the corrective feedback are aligned to learning targets and standards, students are better able to see a pathway to their own personal academic successes and feel there’s a reason to try.”

—Professional Development Toolkit:

[Evidence-Based Practices Supporting the Use of Educational Data.](#)

[The Institute of Education Sciences \(IES\)](#) has five recommendations to help educators use data to effectively evaluate their own instructional practice and to monitor their students’ academic progress. One recommendation encourages students to examine their own data and then set related measurable learning goals.

To help students create realistic goals, share the SMART acronym with students. Goals should be:

SPECIFIC: What exactly does the student want to accomplish academically?

MEASUREABLE: What target does the student want to achieve?

ATTAINABLE: Is it an achievable goal for the student? Goals should be ambitious but realistic.

RELEVANT: Does the goal align with high priority classroom/school/district goals?

TIMEBOUND: Is there a start date and timeframe for achieving the goal? When will progress toward the goal be reviewed?

Once students have identified their goals, encourage them to identify steps to reach their goals. Remind students to routinely pulse check to see if they are on track, and use conferences to more formally review progress toward their SMART goals.

Tool: SMART Template for Student Goal Setting

Purpose: To provide a framework and template for teachers to use when conducting student goal-setting activities.

How to Use This Tool:

1. Introduce the SMART acronym to students, and discuss the importance of setting goals and creating action plans to meet those goals.
2. Have students complete the SMART template prior to their first student conference.
3. Conduct a brief, private conference with students each grading period. During the conference, review their individual SMART goals as well as class and school-wide priorities.
4. Regularly remind students to review their SMART goals and check their progress.

S
SPECIFIC

M
MEASURABLE

A
ATTAINABLE

R
RELEVANT

T
TIMEBOUND

Students write goals that are aligned with school/classroom goals or priority areas.

GOAL: _____

GOAL: _____

How is the goal SMART? Fill in the answers below:

How is the goal SMART? Fill in the answers below:

Specific: _____

Specific: _____

Measureable: _____

Measureable: _____

Attainable: _____

Attainable: _____

Relevant: _____

Relevant: _____

Timebound: _____

Timebound: _____

Action Steps:

Action Steps:

1. _____

1. _____

2. _____

2. _____

3. _____

3. _____

Pulse Checks (Milestones):

Pulse Checks (Milestones):

1. _____

1. _____

2. _____

2. _____

3. _____

3. _____

Next Steps: Your Action Plan

Through techniques such as data walls, student conferences, and goal setting, data analysis can promote a dynamic exchange of conversation and ideas between you and your students as you work together to set mutual goals and improve achievement.

Of course, goal setting and action plans are not just for students. Take a few minutes to identify your short- and long-term goals for using data to improve classroom instruction. Map out a plan for meeting those goals and determine ways to “pulse check” and reassess progress throughout the school year.

What I Plan To Do Now

Focus area(s):

- Data Cycles
- Data Walls
- Student Goal Setting/Conferences

Short-term Goal(s):

Action Plan:

Ways to Assess Progress:

What I Plan To Do This Year

Focus area(s):

- Data Cycles
- Data Walls
- Student Goal Setting/Conferences

Longer-term Goal(s):

Action Plan:

Ways to Check-in on Progress:

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