

# Leading a Team to Analyze Root Causes Using Quality Tools

The Five Whys  
The Fishbone (Cause and Effect) Diagram  
The Affinity (Relationship) Diagram



GEORGIA'S LEADERSHIP INSTITUTE  
FOR SCHOOL IMPROVEMENT

**A Performance-based Learning Module  
for Georgia's Educational Leaders**

Analyze Root Causes

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# Module at a Glance

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# Progress Tracker

**Before  
Beginning this  
Module**

Work with your Coach to determine the order in which you will complete the topics, and write in the appropriate numbers in the Order column. (If you decide together that order does not matter, leave the Order column blank.)

**When You  
Complete this  
Module**

When you have “passed” each of the Assessments, you will have completed this module. Congratulations! Have your Coach sign off in the space provided below, then include this page in the evidence you submit to your Portfolio.

Order	Topic	Date Completed
	The Five Whys	
	The Fishbone Diagram	
	The Affinity Diagram	

<b>Module Completed – Congratulations on Your Performance!</b>	
Performer's Name	Performer's Signature
Coach's Name	Coach's Signature

# Module Objective

**Module Objective**

After working through this module and practicing the skills / behaviors it contains, you will be able to perform the objective below.

Given this...	Do This...	To Meet These Criteria...
<ul style="list-style-type: none"> <li>• A challenge, issue, or opportunity related to student achievement or organizational effectiveness</li> <li>• The need to identify the fundamental, “root” cause(s) of the challenge / issue, in order to identify an appropriate solution (or, in the case of an opportunity, in order to succeed in taking advantage of the opportunity)</li> <li>• A team of educators willing and able to contribute to the analysis session</li> <li>• Data related to the challenge, issue or opportunity</li> </ul>	<p>Conduct an analysis of the challenge / issue / opportunity, using one or more of these quality tools:</p> <ul style="list-style-type: none"> <li>• The Five Whys</li> <li>• The Fishbone Diagram</li> <li>• The Affinity Diagram</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis begins with a written problem statement</li> <li>• The correct quality tool is selected according to the type of analysis needed</li> <li>• The selected quality tool is used correctly</li> <li>• Analysis results include:               <ul style="list-style-type: none"> <li>○ A list of potential root causes</li> <li>○ One or more causes identified for further study</li> <li>○ A list of additional research / data to be collected to validate the probable cause(s)</li> </ul> </li> </ul>

**Additional Criteria**

For additional criteria related to each specific quality tool, thoroughly review the Performance Checklists (located in the Final Assessment and in each Practice) and the Assessment Feedback Forms (located in the Final Assessment only) for each topic in this module.

# Module Overview

## **Why is Analyzing Causes Important?**

To find the right solutions for deficiencies in students' achievement, those who are working to solve the problems must determine what problem they are trying to solve, and the true causes of the problem.

Any easy trap to fall into is to jump to a solution before ensuring the right problems have been identified. Digging deep beneath the symptoms of problems exposes the root causes so that the right solutions can be applied to improve student achievement and organizational effectiveness.

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## **When to Analyze Causes (Cues)**

There are several cues that suggest the time is right to analyze causes:

- Performance data indicates that student and/or organizational performance is below standards or below goals set by the organization.
  - Performance data indicates an improvement in performance that is not readily attributed to focused efforts to improve those results.
  - The team has tried unsuccessfully in the past to solve the problem.
  - The problem or situation is complex.
  - Members of the team are prone to jump to conclusions or have strong opinions about solutions before analyzing the causes.
  - There are possibly multiple causes to a problem, and/or contributing factors to problems.
-

**Does Educational Context Matter?**

Root cause analysis can be used in any size or type of school, with teachers, staff, school councils, and other stakeholder groups that the school leader wishes to engage in examining root causes.

The processes for cause analysis are simple and inexpensive. Teachers of elementary children can even use these tools with their students; therefore, adults in the school should have no problem learning to use them. The biggest factor in their introduction is whether or not those using them are accustomed to using a scientific approach to looking at causes.

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**What is the Leader's Role?**

The leader of cause analysis guides the team through structured processes that ensure all team members can participate in examining the causes, sharing their theories regarding the contributing factors or drivers, and determining how, when and where to get the data to validate the potential causes and drivers.

The leader helps to focus the team on using a scientific approach to find underlying causes. The leader creates a climate in the group that focuses the team on systemic and process-related causes of problems, rather than placing blame or making excuses.

The leader must create conditions in which the team seeks continuous improvement in the processes and systems in their classrooms and schools, rather than blaming others or avoiding the real issues behind deficiencies.

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**What Resources are Used to Analyze Causes?**

Before beginning cause analysis, the following resources should be at hand:

- Flip charts or other materials for recording and displaying the information generated
  - Markers or pens/pencils
  - Self-stick notes, index cards or pieces of paper which can be moved and manipulated
-

**Tip(s)**

When analyzing causes with others, it is important as the leader to allow a free flow of ideas, without discouraging the participants or allowing one or two participants or the leader to dominate the analysis.

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**What Do I Do Next?**

Turn the page to read about how your performance of this module will be assessed and evaluated.

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# Final Assessment

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## **About The Final Assessment**

The Final Assessment for this module has 3 parts – one for each of the quality tools learned herein. You may complete each part of the Final Assessment one-at-a-time, or you may complete all three parts during one session. Work with your Coach to determine the best approach for you (which may depend on the resources at your disposal).

There are 3 differences between this module's Practices and its Final Assessment:

1. In Practices, you will be using the quality tools by yourself (to make sure you learn thoroughly how they work). In the Final Assessment, you will be leading a team through using the quality tool. Therefore, each Final Assessment includes an extra 2-page form (called the Assessment Feedback Form) on which your Coach will give you feedback on how you performed in the role of "leading the team." You will not see this form in the Practice sections.
  2. In Practices, we have provided sample Scenarios (similar to word problems) for you to work through. For the Final Assessment, no scenarios are provided. Based on your knowledge of the quality tools, you should select an issue or problem to which it is appropriate to apply the quality tool(s) in the Final Assessment. Work with your Coach to make sure that you have good scenarios to use during your Final Assessment.
  3. In practices, we have provided Worksheets that guide you in drawing or working through the quality tool you are learning. However, no Worksheets are provided for the Final Assessment. Based on your knowledge of the quality tools, you should create your own diagrams and notes using whatever media you wish.
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**Why Review  
the Final  
Assessment?**

Reviewing the Final Assessment will ensure that you understand the knowledge, skills and behaviors that are being taught and tested in this module. It will help you gauge your current level of performance against what will be expected of you by the end of the module. This will help you know which areas to concentrate on as you work through the module.

If you feel that you are already proficient in the knowledge, skills and behaviors needed to pass the Final Assessment, you may perform the Final Assessment now. If your performance on the Final Assessment meets all the criteria, you can “test out” of this module.

Or, if you feel you need more learning and practice before trying the Final Assessment, continue working your way through the module.

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**How to  
Complete  
this Final  
Assessment**

1. Gain permission from your supervisor or Coach to complete the Final Assessment in a school setting.
  2. Schedule the date, time and location of your session – one that works for you, your Coach, and the teachers / staff / leaders who will participate.
  3. Invite the participants (or, your Coach may prefer to invite them).
  4. Provide your Coach with a copy of the Final Assessment Performance Checklist and Final Assessment Feedback Form for this activity, as well as the Coach’s Guide (if available).
  5. Prepare any other materials or information that you and your participants need to have with you on the day of the activity.
  6. Prepare to perform by reviewing the content, Step-Action Tables and Worksheets for all of the topics in this module.
-

**Requirements**

This assessment must be:

- Performed in an actual school environment
- Performed with a team of teachers and staff (or other leaders)
- Observed by a Leadership Coach

In order to be entered into your Portfolio, your performance / evidence must:

- Meet the criteria listed on the Assessment Performance Checklist
  - Earn a rating of 3 or 4 on the Assessment Feedback Form
- 

**When Can I Add to my Portfolio?**

If your Coach feels you need more practice, repeat the appropriate Topics and/or Practices in this module until you both are satisfied that you are ready to take the Final Assessment again.

When (a) your performance meets all the listed criteria, and (b) your Coach rates your performance as “Proficient” or higher, you may enter the following items into your Portfolio:

- Evidence of performance
- Final Assessment Performance Checklist
- Final Assessment Feedback Form
- Any additional artifacts you wish to include (video or audio tape, participant feedback, etc.)

You are encouraged to continue practicing and performing this task until you achieve a rating of “Distinguished” and then to update your Portfolio with those evidentiary items.

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**What Do I Do Next?**

Turn the page to review or take the Final Assessment.

Or, skip to the first Topic in this module.

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## Assessment Performance Checklist - The Five Whys

**Performer's Name:** \_\_\_\_\_

**Coach's Name:** \_\_\_\_\_

**Date of Performance:** \_\_\_\_\_

Performance Evidence	Present?	Meets Criteria?
1. A written Problem Statement	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Written in two sentences or less <input type="checkbox"/> Defines the gap in performance, or the symptoms <input type="checkbox"/> Does not list the causes or drivers of the problem
2. A list of potential Causes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Includes two or more causes <input type="checkbox"/> May contain drivers or factors contributing to the causes <input type="checkbox"/> Causes point to processes and systems – not to individuals, teams or departments <input type="checkbox"/> Statements do not infer blame or reference excuses
3. One cause identified for Further Study	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Targeted cause is identified in writing <input type="checkbox"/> The group has the ability and authority to take action on this cause
4. A list of additional research/data to be collected to validate the causes/drivers	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> List includes one or more types of data that could validate the assumption <input type="checkbox"/> Sources are listed for each data

**Assessment Feedback Form - The Five Whys (page 1 of 2)**

**Performer's Name:** \_\_\_\_\_

**Coach's Name:** \_\_\_\_\_

**Date of Performance:** \_\_\_\_\_

Performance Levels			
1	2	3	4
<p><b>Emerging</b> Needs Study and Practice</p> <p><i>Few or none of the desired behaviors were adequately displayed.</i></p>	<p><b>Developing</b> Needs Practice</p> <p><i>Some but not all of the desired behaviors were adequately displayed.</i></p>	<p><b>Proficient</b> Meets criteria and expectations</p> <p><i>All desired behaviors were displayed and performed correctly.</i></p>	<p><b>Distinguished</b> Could be Used as a Model to Teach Others</p>
		<p><b>Eligible for Portfolio</b></p>	

How effective was the performer in:	Rating			
1. Engaging all team members in the process?	1	2	3	4
2. Generating a list of causes without jumping to solutions?	1	2	3	4
3. Examining multiple factors relating to the problems?	1	2	3	4
4. Expanding the thinking of those working on the problem?	1	2	3	4
5. Encouraging a systemic view of the work in schools?	1	2	3	4
6. Focusing on improvement of processes?	1	2	3	4

**Turn the page to provide additional written feedback (required).**

## Assessment Feedback Form – The Five Whys (page 2 of 2)

**Performer's Name:** \_\_\_\_\_

**Coach's Name:** \_\_\_\_\_

**Date of Performance:** \_\_\_\_\_

If any element was rated less than 3, what needs to be done to score a 3? To score a 4?

What greatest strengths did the leader exhibit through this performance?

What could be done to improve the Value-Added Leadership performance?

Other comments or suggestions.

## Assessment Performance Checklist - Fishbone Diagram

**Performer's Name:** \_\_\_\_\_

**Coach's Name:** \_\_\_\_\_

**Date of Performance:** \_\_\_\_\_

Performance Evidence	Present?	Meets Criteria?
1. Written Problem Statement	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Written in two sentences or less <input type="checkbox"/> Defines the gap in performance or the symptoms <input type="checkbox"/> Does not list the causes or drivers of the problem <input type="checkbox"/> Written into the "head" of the fishbone
2. Categories of Possible Causes are Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> At least 4 categories related to the problem are identified <input type="checkbox"/> Categories reflect the aspects of the problem being analyzed, or surface-level causes or symptoms <input type="checkbox"/> Possible causes/categories are written in boxes on the end of major "bones" of the fishbone
3. Possible Causes are Identified and Categorized	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> At least 3 causes are listed in each major category (12 or more total) <input type="checkbox"/> Causes may contain drivers or factors contributing to the causes <input type="checkbox"/> Causes point to processes and systems – not to individuals, teams or departments <input type="checkbox"/> Statements do not infer blame or reference excuses <input type="checkbox"/> Causes are written on smaller lines or "bones" off the major category "bone" to which they apply

## Assessment Performance Checklist – Fishbone Diagram (continued)

Performance Evidence	Present?	Meets Criteria?
4. Cause Relationships Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Lines or circles are drawn (within or across categories) to indicate which causes may be related
5. Most Probably, Actionable Cause Selected	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> One or more “most probable cause” is identified <input type="checkbox"/> Cause is actionable by this team
6. Additional Data and Sources Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Data to be collected that can validate the cause assumptions is listed <input type="checkbox"/> Sources of listed data are identified

***If the evidence of your performance meets all of the listed criteria, you are ready to move on to the Assessment. If not, continue studying, practicing and/or working with your Coach then try it again.***

**Assessment Feedback Form – Fishbone Diagram (page 1 of 2)**

**Performer’s Name:** \_\_\_\_\_

**Coach’s Name:** \_\_\_\_\_

**Date of Performance:** \_\_\_\_\_

Performance Levels			
1	2	3	4
<p><b>Emerging</b> Needs Study and Practice</p> <p><i>Few or none of the desired behaviors were adequately displayed.</i></p>	<p><b>Developing</b> Needs Practice</p> <p><i>Some but not all of the desired behaviors were adequately displayed.</i></p>	<p><b>Proficient</b> Meets criteria and expectations</p> <p><i>All desired behaviors were displayed and performed correctly.</i></p>	<p><b>Distinguished</b> Could be Used as a Model to Teach Others</p>
		<p><b>Eligible for Portfolio</b></p>	

How effective was the performer in:	Rating			
1. Engaging all team members in the process?	1	2	3	4
2. Generating a list of causes without jumping to solutions?	1	2	3	4
3. Examining multiple factors relating to the problems?	1	2	3	4
4. Expanding the thinking of those working on the problem?	1	2	3	4
5. Encouraging a systemic view of the work in schools?	1	2	3	4
6. Focusing on improvement of processes?	1	2	3	4

**Turn the page to provide additional written feedback (required).**

**Assessment Feedback Form – Fishbone Diagram (page 2 of 2)**

**Performer's Name:**

\_\_\_\_\_

**Coach's Name:**

\_\_\_\_\_

**Date of Performance:**

\_\_\_\_\_

If any element was rated less than 3, what needs to be done to score a 3? To score a 4?

\_\_\_\_\_

What greatest strengths did the leader exhibit through this performance?

\_\_\_\_\_

What could be done to improve the Value-Added Leadership performance?

\_\_\_\_\_

Other comments or suggestions.

\_\_\_\_\_

## Assessment Performance Checklist – Affinity Diagram

**Performer's Name:** \_\_\_\_\_

**Coach's Name:** \_\_\_\_\_

**Date of Performance:** \_\_\_\_\_

Performance Evidence	Present?	Meets Criteria?
1. Written Problem Statement	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Written in two sentences or less <input type="checkbox"/> Defines the gap in performance or the symptoms <input type="checkbox"/> Does not list the causes or drivers of the problem
2. List of Causes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Causes listed on individual pieces of paper <input type="checkbox"/> Causes point to processes and systems, not blame or excuses
3. Categories Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Causes grouped into categories showing relationships <input type="checkbox"/> Title of category is listed above its grouping of causes
4. Relationships Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Arrows are drawn between causes and categories to indicate links <input type="checkbox"/> Arrows show contributing causes (arrow leaving) and causes impacted (arrows entering)
5. Key Causes Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1 – 3 primary drivers are selected for further study <input type="checkbox"/> Drivers selected are those that have the most arrows leaving them
6. Additional Data to be collected Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Data to be collected for further research of causes is listed <input type="checkbox"/> Source(s) of data are included

## Assessment Feedback Form – Affinity Diagram (page 1 of 2)

**Performer's Name:** \_\_\_\_\_

**Coach's Name:** \_\_\_\_\_

**Date of Performance:** \_\_\_\_\_

Performance Levels			
1	2	3	4
<p><b>Emerging</b> Needs Study and Practice</p> <p><i>Few or none of the desired behaviors were adequately displayed.</i></p>	<p><b>Developing</b> Needs Practice</p> <p><i>Some but not all of the desired behaviors were adequately displayed.</i></p>	<p><b>Proficient</b> Meets criteria and expectations</p> <p><i>All desired behaviors were displayed and performed correctly.</i></p>	<p><b>Distinguished</b> Could be Used as a Model to Teach Others</p>
		<b>Eligible for Portfolio</b>	

How effective was the performer in:	Rating			
1. Engaging all team members in generating causes?	1	2	3	4
2. Generating a list of causes without jumping to solutions?	1	2	3	4
3. Examining multiple factors relating to the problems?	1	2	3	4
4. Expanding the thinking of those working on the problem?	1	2	3	4
5. Encouraging a systemic view of the work in schools?	1	2	3	4
6. Focusing on improvement of processes?	1	2	3	4

**Turn the page to provide additional written feedback (required).**

## Assessment Feedback Form – Affinity Diagram (page 2 of 2)

**Performer's Name:** \_\_\_\_\_

**Coach's Name:** \_\_\_\_\_

**Date of Performance:** \_\_\_\_\_

If any element was rated less than 3, what needs to be done to score a 3? To score a 4?

What greatest strengths did the leader exhibit through this performance?

What could be done to improve the Value-Added Leadership performance?

Other comments or suggestions.

# Topic #1: The Five Whys

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## **Why Use The Five Whys?**

This process helps the team to look several layers below the surface symptoms to underlying, deeper causes.

Although the name suggests going down five levels, it is more important to go to a level that allows the team to address a cause it can take action to address.

For example, the team may not be able to address the cause of the problem that some parents do not or cannot help students with their homework, but it could change homework procedures or create a program to help students with homework.

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## **How Do I Do It?**

Use the Step-Action Table (starting on the next page) to work through the process.

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<b>Step Action Table – The Five Whys</b>	
<b>Step</b>	<b>Action</b>
<b>Collect resources</b>	Assemble the materials needed to engage a team in this activity: pens or markers, a flipchart or erasable surface that is visible to the team
<b>Assemble the team</b>	Select the participants to engage in the activity
<b>Review the purpose</b>	Explain that cause analysis can help identify root causes, develop better solutions and identify the data needed to verify assumptions about causes.
<b>Develop a problem statement</b>	Write a sentence or two that defines the gap in performance or the symptoms, but that does not list the causes or drivers of the problem.
<b>Ask Why #1</b>	Ask why the problem occurs and write down an answer that the team will agree to take to a deeper level.
<b>Ask Why #2</b>	Ask why that driver occurs
<b>Repeat for Why #3 – # 5</b>	Continue five times or until an actionable cause has been uncovered; if no actionable cause can be identified, generate another level-one cause of the problem and repeat the process.
<b>Determine data needed to verify the cause</b>	Identify the data which could verify whether or not the cause identified truly is the cause; determine where and how to access the data.  If no data can be collected, identify solutions to test on a small-scale before implementing any large scale or permanent changes.

# Practice #1: The Five Whys

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## About this Practice

- Use the sample situation to practice the Five Why's to develop assumptions about why the problem may be occurring in the school.
  - Do this activity alone at least once before asking colleagues or a group of peers to practice it with you.
- 

## How To Complete the Practice

1. Feel free to refer back to the Five Whys Step Action Table as needed during this practice.
  2. Before you begin, review these items on the next few pages:
    - **How to Check Your Work** – this describes how you will know when you've completed the practice successfully and are ready to move on to the Assessment
    - **Practice Scenario** – this is the problem you will analyze using the Five Whys process
    - **Five Whys Worksheet** – this is where you will record your work
    - **Performance Checklist** – this lists the criteria used to evaluate your work
  3. When you are ready, perform the Five Whys process and record your work on the Worksheet.
  4. When you have finished, return to **How to Check Your Work** to evaluate your performance and decide what to do next.
-

**How to Check Your Work**

- Review your results against the Performance Checklist to make sure you have produced all the required evidence of performance.
  - If your results did not meet all the criteria, you need more practice. Do one or both of the following:
    - Choose another type of school problem you have experienced in the past, and work through it again on your own, and check your work.
    - Assemble a group of peers to work through a scenario with you. Ask those who worked with you to help check your work and give you feedback on your performance
  - Once you have met all the Performance Criteria, work with your Coach to schedule a time to take the Assessment.
- 

**Practice Scenario**

Swanson High School is a school of 1200 students in an urban area. The school has made significant progress over the last two years in increasing the number of students who pass the state's High School Graduation Ttest (GHSGT). However, over the last two years daily student attendance has averaged 73%. The superintendent has asked the leadership team of the school to come up with a solution to the daily attendance problem.

1. Based on your school (or your experience with schools), craft a realistic Five Whys experience (the questions and the answers) listing possible causes for investigation in the scenario above.
2. Determine which of the causes you came up with are actionable, based on the current conditions in your school (that is, would they be actionable in your school?).

## Worksheet - The Five Whys

Problem Statement:	
--------------------	--

Why is this occurring?	
------------------------	--

Why is this occurring?	
------------------------	--

Why is this occurring?	
------------------------	--

Why is this occurring?	
------------------------	--

Why is this occurring?	
------------------------	--

Actionable Cause:	
-------------------	--

Additional Data Needed	Source?

## Performance Checklist - The Five Whys

Performance Evidence	Present?	Meets Criteria?
1. A written Problem Statement	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Written in two sentences or less <input type="checkbox"/> Defines the gap in performance, or the symptoms <input type="checkbox"/> Does not list the causes or drivers of the problem
2. A list of potential Causes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Includes two or more causes <input type="checkbox"/> May contain drivers or factors contributing to the causes <input type="checkbox"/> Causes point to processes and systems – not to individuals, teams or departments <input type="checkbox"/> Statements do not infer blame or reference excuses
3. One cause identified for Further Study	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Targeted cause is identified in writing <input type="checkbox"/> The group has the ability and authority to take action on this cause
4. A list of additional research/data to be collected to validate the causes/drivers	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> List includes one or more types of data that could validate the assumption <input type="checkbox"/> Sources are listed for each data

***If the evidence of your performance meets all of the listed criteria, you are ready to move on to the Assessment. If not, continue studying, practicing and/or working with your Coach then try it again.***

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## Topic #2: The Fishbone Diagram

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### The Fishbone Diagram

The Fishbone Diagram is used as part of a process to look at a narrowly defined problem and investigate potential underlying causes.

It is known as a Fishbone Diagram because it resembles a fish skeleton. It is also sometimes called an Ishikawa Diagram (after its inventor, Dr. Kaoru Ishikawa) or a Cause and Effect Diagram.

It can be used by an individual, but is most often used as part of a group analysis process.

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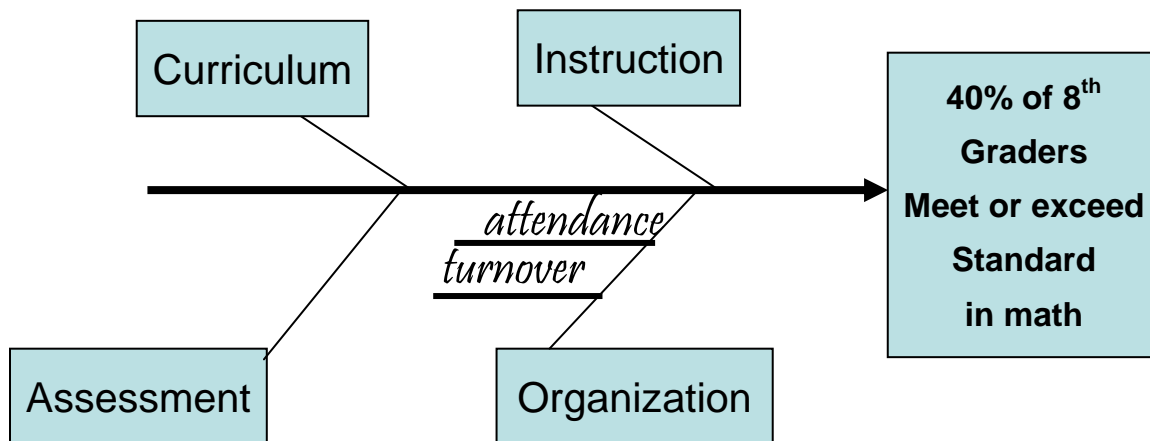
### Why Use the Fishbone Diagram?

Using the diagram helps to focus on the potential causes by providing a visual structure that organizes them. By putting possible causes on a visual diagram, you can get a picture of factors contributing to a problem and see possible relationships between problems

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### Samples

This is what a Fishbone Diagram may look like:



### How Do I Do It?

Use the Step-Action Table (starting on the next page) to work through the process.

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<b>Step Action Table – The Fishbone Diagram</b>	
Step	Action
<b>Plan for the Analysis Session</b>	<p>Assemble the materials needed to engage a team in this activity:</p> <ul style="list-style-type: none"> <li>• pens or markers</li> <li>• post-it notes</li> <li>• a flipchart or erasable surface that is visible to the team</li> </ul> <p>Select the participants to engage in the activity, and schedule the event.</p>
<b>Review the purpose</b>	<p>Open the session by explaining that cause analysis can help identify root causes, develop better solutions and identify the data needed to verify assumptions about causes.</p>
<b>Develop a problem statement</b>	<p>Write a sentence or two that defines the gap in performance or the symptoms, but that does not list the causes or drivers of the problem.</p>
<b>Identify the major categories in which potential causes may reside</b>	<p>Capture four to five major, generic categories on paper.</p> <p><b>TIP:</b> Try working with one of these category sets:</p> <ul style="list-style-type: none"> <li>• <b>Operational categories</b> such as: people, processes, equipment, procedures, facilities, training, etc.</li> <li>• <b>School-based categories</b> such as: curriculum, instruction, assessment, tools and resources, and organizational factors.</li> <li>• Or, develop categories based on the main symptoms of the problem being addressed.</li> </ul>

**Step Action Table – The Fishbone Diagram (continued)**

Step	Action
<p><b>Create the diagram</b></p>	<p>Draw the diagram and write on it as follows, so that it appears like the sample provided below:</p> <ol style="list-style-type: none"> <li>1. Write the problem statement at the “head” of the fishbone</li> <li>2. Draw a central line or “backbone” connecting to the head</li> <li>3. Draw as many “bones” or lines as needed for each major category of causes (4 to 6 is ideal)</li> <li>4. Draw a box at the end of each “bone” for the labels for the major categories</li> <li>5. Draw the smaller bones for each of the ideas for causes in each category</li> </ol>
<p><b>Identify the potential causes in each category type</b></p>	<p>List ideas for causes in each category, which will be placed on the small “bones” in each category to which they apply.</p> <p>If a cause applies to more than one category, list it in each place.</p> <p>Generate at least a dozen potential causes (at least 2 for each “bone”) and continue brainstorming for as long as the team desires.</p>

<b>Step Action Table – The Fishbone Diagram (continued)</b>	
Step	Action
	<p><b>TIP:</b> You may wish to have participants capture initial ideas on self-stick notes or paper for each category, rather than writing them directly onto the diagram. This allows for several processing techniques:</p> <p>(a) individuals can place their causes on the fishbone in silence, and/or</p> <p>(b) the facilitator can move causes around from one category to the other according to team discussion.</p>
<b>Determine relationships</b>	Draw lines between the causes on each “bone” that seem to be related.
<b>Agree upon the most probable cause(s)</b>	<p>When all the possible causes have been listed, evaluate them and circle the cause(s) the group chooses as the most probable cause(s).</p> <p><b>IMPORTANT:</b> Be sure to choose cause(s) that are <b>actionable</b> – those over which the group has some power to effect change.</p>
<b>Determine what additional data is needed to verify the cause(s)</b>	<p>Identify the data which could verify whether or not the most probable causes identified are the causes.</p> <p>Determine where and how to access the data, and make assignments for follow-up tasks.</p> <p>If no data can be collected, identify solutions to test on a small scale before implementing any large scale or permanent changes.</p>

## Practice #2: The Fishbone Diagram

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### About this Practice

- Use the sample situation provided to practice using Fishbone Diagrams to develop assumptions about why a problem may be occurring in a school.
  - Do this activity alone at least once before asking colleagues or a group of peers to practice it with you.
  - When you practice with a group, facilitate the session as if you were the principal in the scenario.
- 

### How To Complete the Practice

1. Feel free to refer back to the Fishbone Step Action Table as needed during this practice.
  2. Before you begin, review these items on the next few pages:
    - **How to Check Your Work** – this describes how you will know when you've completed the practice successfully and are ready to move on to the Assessment
    - **Practice Scenario** – this is the problem you will analyze using the Fishbone Diagram process
    - **Fishbone Worksheet** – this is where you will record your work. Add as many “bones” to the graphic as you need.
    - **Performance Checklist** – this lists the criteria used to evaluate your work
  3. When you are ready, perform the Fishbone Diagram steps and record your work on the Worksheet.
  4. When you have finished, return to **How to Check Your Work** to evaluate your performance and decide what to do next.
-

**How to Check  
Your Work**

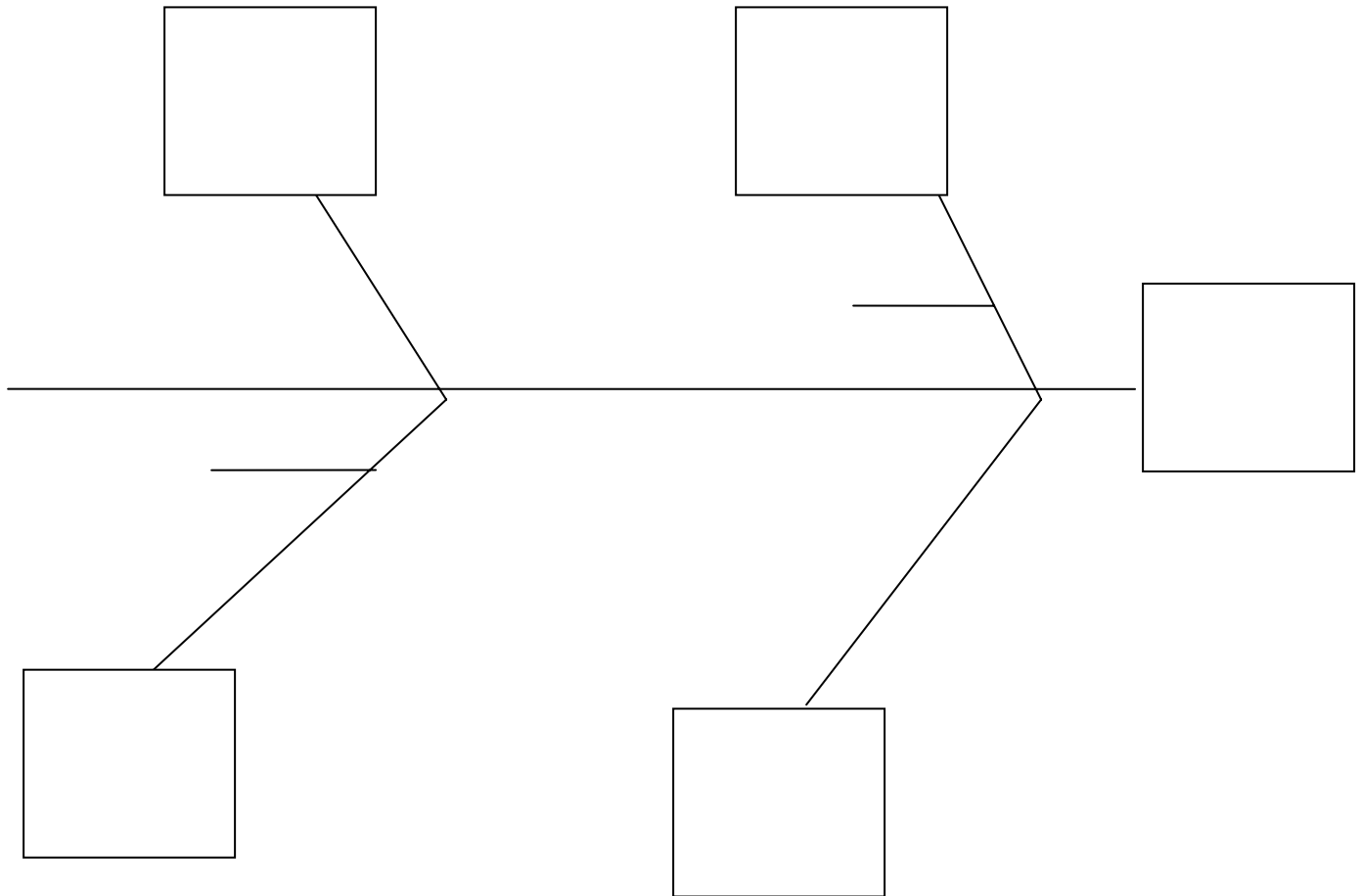
- Review your results against the Performance Checklist to make sure you have produced all the required evidence of performance, and that all evidence meets the criteria.
  
  - If your results did not meet all the criteria, you need more practice. Do one or more of the following:
    - Choose another type of school problem you have experienced in the past (or ask your Coach to suggest one), work through it again on your own, and check your work.
  
    - Assemble a group of peers to work through a scenario with you. Ask those who worked with you to help check your work and give you feedback on your performance.
  
    - Consult with your Coach for additional information, resources, feedback and suggestions, and practice ideas.
  
  - Once you have met all the Performance Criteria, work with your Coach to schedule a time to take the Assessment.
-

**Practice  
Scenario**

Franz Middle School is a school of 800 students in a rural area that is growing rapidly. Over the last year discipline referrals have increased dramatically. A new principal has been assigned to the school. Her superintendent has charged her with getting the discipline challenges under control. She observed that the students don't seem to know the rules and there is not a common understanding of the rules and expectations. She suspects that there are other issues that also underlie the problem. She wants to call together a group of leaders, teachers and staff to determine the causes.

1. Create a fishbone diagram for the scenario above. If there are "holes" in the information you need, apply facts from your own school experience.
2. Determine which of the causes you came up with are actionable, based on the current conditions in your school.

**Worksheet - Fishbone Diagram**



Most Probable Cause:	

Additional Data Needed to Validate	Source?

## Performance Checklist – Fishbone

Performance Evidence	Present?	Meets Criteria?
1. Written Problem Statement	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Written in two sentences or less <input type="checkbox"/> Defines the gap in performance or the symptoms <input type="checkbox"/> Does not list the causes or drivers of the problem <input type="checkbox"/> Written into the “head” of the fishbone
2. Categories of Possible Causes are Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> At least 4 categories related to the problem are identified <input type="checkbox"/> Categories reflect the main symptoms of the problem being analyzed <input type="checkbox"/> Possible causes/categories are written in boxes on the end of major “bones” of the fishbone
3. Possible Causes are Identified and Categorized	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> At least 3 causes are listed in each major category (12 or more total) <input type="checkbox"/> Causes may contain drivers or factors contributing to the causes <input type="checkbox"/> Causes point to processes and systems – not to individuals, teams or departments <input type="checkbox"/> Statements do not infer blame or reference excuses <input type="checkbox"/> Causes are written on smaller lines or “bones” off the major category “bone” to which they apply

## Performance Checklist – Fishbone (continued)

Performance Evidence	Present?	Meets Criteria?
4. Cause Relationships Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Lines or circles are drawn (within or across categories) to indicate which causes may be related
5. Most Probably, Actionable Cause Selected	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> One or more “most probable cause” is identified <input type="checkbox"/> Cause is actionable by this team
6. Additional Data and Sources Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Data to be collected that can validate the cause assumptions is listed <input type="checkbox"/> Sources of listed data are identified

***If the evidence of your performance meets all of the listed criteria, you are ready to move on to the Assessment. If not, continue studying, practicing and/or working with your Coach then try it again.***

## Topic #3: The Affinity Diagram

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### **The Affinity Diagram**

The Affinity Diagram is a tool that helps identify the most important causes of a problem – particularly when the problem is systemic or cannot easily be analyzed with a tool that examines in a more sequential way.

This tool is also called the “Relationship Diagram” because it shows the connections/relationships between causes, and it shows which causes are alike in some manner.

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### **Why use the Affinity Diagram?**

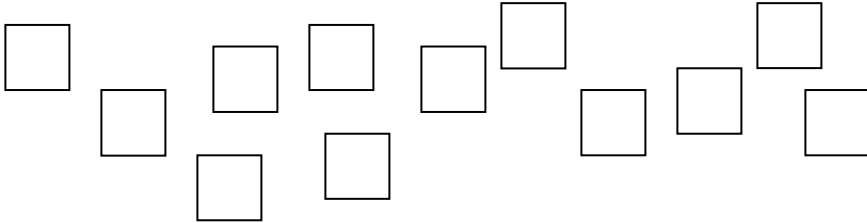
Use this tool / process:

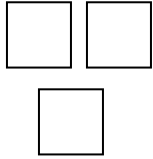
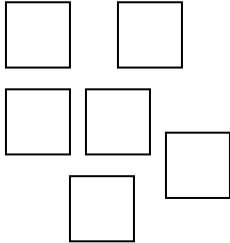
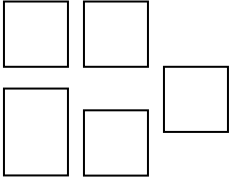
- for systemic problems and those that are not easily analyzed with other tools
  - to encourage creative thinking and “systems thinking” about a problem, in order to get below the surface issue to more systemic causes
  - to determine the major causes or drivers of a problem, so that you can then use a tool like the Fishbone Diagram (to categorize and expand the list of problems) or The Five Whys (to drill down deeper into one possible cause)
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### **How Do I Do It?**

Use the Step-Action Table (starting on the next page) to work through the process.

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<b>Step-Action Table – Affinity Diagram</b>	
Step	Action
<b>Plan for the Analysis Session</b>	<p>Assemble the materials needed to engage a team in this activity:</p> <ul style="list-style-type: none"> <li>• pens or markers</li> <li>• post-it notes</li> <li>• a flipchart or erasable surface that is visible to the team</li> </ul> <p>Select the participants to engage in the activity, and schedule the event.</p>
<b>Review the purpose</b>	<p>Open the session by explaining that cause analysis can help identify root causes, develop better solutions and identify the data needed to verify assumptions about causes.</p>
<b>Develop a problem statement</b>	<p>Write a sentence or two that defines the gap in performance or the symptoms, but that does not list the causes or drivers of the problem.</p>
<b>Brainstorm all issues causing or contributing to the problem</b>	<p>Brainstorm about all the possible causes of the problem, and list each one on its own self-stick note.</p> <p>Post all of the self-stick notes onto the flip chart or board, in no particular order.</p> <p>Your workspace may look something like this:</p>
	

<p><b>Categorize the possible causes</b></p>	<p>Spend a few minutes “clumping” related notes together. This is usually done in silence; participants may observe each other move notes, and then come up and move them again into another group.</p> <p>If any note belongs in more than one group, make a duplicate note and add it to the other categories.</p> <p>Your workspace may now look like this:</p>
<div style="display: flex; justify-content: space-around; text-align: center;"> <div style="margin: 10px;"> <p><u>Class Mgmt</u></p>  </div> <div style="margin: 10px;"> <p><u>Discipline</u></p>  </div> <div style="margin: 10px;"> <p><u>Attendance</u></p>  </div> </div>	
<p><b>Indicate relationships</b></p>	<p>Once the “clumping” activity has stabilized, review each group and give it a title that captures the essence of the overall problem. (This title can eventually become a category for a Cause and Effect diagram, for example.)</p> <p>Now, consider each group and each note within that group. Draw lines or arrows on the diagram to indicate causes and categories that affect, contribute to each other, or are otherwise related. You might draw:</p> <ul style="list-style-type: none"> <li>• an arrow between two causes within a category</li> <li>• an arrow from a cause in one category to a cause in another category</li> <li>• a circle around a whole category, pointing to another whole category or to a single cause in another category</li> </ul> <p>Your workspace may now look something like this:</p>

<p><b>Determine key drivers of causes</b></p>	<p>Identify the key drivers and causes by noticing which items have the most arrows coming into or out of them.</p> <p><b>TIP:</b> Anything that looks like a “porcupine” is a prime candidate for further exploration!</p>
<p><b>Select causes to collect more data</b></p>	<p>Determine 1 to 3 causes to collect more data for further investigation.</p>
<p><b>Determine data needed to verify the cause</b></p>	<p>Identify the data which could provide more information about the probable causes and their contributing factors; determine where and how to access the data.</p> <p>If no data can be collected, identify solutions to test on a small scale before implementing any large scale or permanent changes.</p>

## Practice #3: Affinity Diagram

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### About this Practice

- Practice using an Affinity Diagram to develop assumptions about drivers of causes.
  - Do this activity alone at least once before asking colleagues or a group of peers to practice it with you.
  - When you practice with a group, facilitate the session as if you were the principal in the example.
- 

### How To Complete the Practice

1. Feel free to refer back to the Affinity Diagram Step Action Table as needed during this practice.
  2. Before you begin, review these items on the next few pages:
    - **How to Check Your Work** – this describes how you will know when you've completed the practice successfully and are ready to move on to the Assessment
    - **Practice Scenario** – this is the problem you will analyze using the Relationship Diagram
    - **Affinity Diagram Worksheet** – this is where you will record your work
    - **Performance Checklist** – this lists the criteria used to evaluate your work
  3. When you are ready, perform the Affinity Diagram process and record your work on the Worksheet.
  4. When you have finished, return to **How to Check Your Work** to evaluate your performance and decide what to do next.
-

**How to Check Your Work**

- Review your results against the Performance Checklist to make sure you have produced all the required evidence of performance, and that all evidence meets the criteria.
  
  - If your results did not meet all the criteria, you need more practice. Do one or more of the following:
    - Choose another type of school problem you have experienced in the past (or ask your Coach to suggest one), work through it again on your own, and check your work.
  
    - Assemble a group of peers to work through a scenario with you. Ask those who worked with you to help check your work and give you feedback on your performance.
  
    - Consult with your Coach for additional information, resources, feedback and suggestions, and practice ideas.
  
  - Once you have met all the Performance Criteria, work with your Coach to schedule a time to take the Assessment.
- 

**Practice Scenario**

Abercrombie Elementary School is a school of 600 students in a high poverty area. When the state test data was received, the third grade reading scores were lower than expected. The first reaction of the school team was to search for a new reading program. The principal suspects that the problem is not entirely created by the reading program currently in place. He wants to call together a group of leaders, teachers and staff to determine the causes.

1. Create a relationship diagram for this problem, supplementing the information above by drawing from the situation in your own school.
  
2. Determine which of the causes you came up with are actionable, based on the current conditions in your school
  
3. If you are a High School leader, substitute “Language Arts scores” on the GHSGT for “reading scores” in the scenario above.

## Performance Checklist – Affinity Diagram

Performance Evidence	Present?	Meets Criteria?
1. A written Problem Statement	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Written in two sentences or less <input type="checkbox"/> Defines the gap in performance or the symptoms <input type="checkbox"/> Does not list the causes or drivers of the problem
2. List of Causes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Causes listed on individual pieces of paper <input type="checkbox"/> Causes point to processes and systems, not blame or excuses
3. Categories Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Causes grouped into categories showing relationships <input type="checkbox"/> Title of category is listed above its grouping of causes
4. Relationships Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Arrows are drawn between causes and categories to indicate links <input type="checkbox"/> Arrows show contributing causes (arrow leaving) and causes impacted (arrows entering)
5. Key Causes Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1 – 3 primary drivers are selected for further study <input type="checkbox"/> Drivers selected are those that have the most arrows leaving them
6. Additional Data to be collected Identified	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Data to be collected for further research of causes is listed <input type="checkbox"/> Source(s) of data are included

***If the evidence of your performance meets all of the listed criteria, you are ready to move on to the Assessment. If not, continue studying, practicing and/or working with your Coach then try it again.***

## Worksheet - Affinity Diagram

After you have worked out your Affinity Diagram on a board or flip chart, re-create it here by filling in (some or all of) the categories, listing (some or all of) the possible causes under each category, and drawing in the arrows between causes/categories. (If you prefer to draw free-hand, use the back of this page.)

Problem Statement:	
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Category 1:	Category 2:	Category 3:	Category 4:

1-3 Probable Drivers:	
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Additional Research / Data Needed	Source(s)?

# Recommended Readings & Resources

Bernhardt, V. (1998). Data Analysis for Comprehensive Schoolwide Improvement. Larchmont, NY: Eye on Education.

Change, R. & Dalziel, D. (1999). Continuous Improvement Tools in Education. Houston, TX: American Productivity and Quality Center.

Conzemius, A. & O'Neill, J. (2002). SMART School Teams. Bloomington, IN: National Educational Service (NES).

Goal/QPC. (1992). The Memory Jogger for Education. Salem, NH: Goal/QPC.

(2005). Using Quality Tools to Analyze and Display Data (A Performance-Based Learning Module). Atlanta, GA: GLISI.