

Root Cause Analysis Protocol: Fishbone

Principles of Root Cause Analysis

- Aims performance improvement measures at root causes which are more effective than treating the symptoms or factors that may contribute to a problem.
- To be effective, RCA must be performed systematically with conclusions that are backed by documented evidence.
- There is usually more than one potential root cause for any given problem.
- To be effective, the analysis must establish all known causal relationships between the root cause(s) and the defined problem.

Root Cause Analysis can be applied to almost any situation. Determining how far to go in your investigation requires good judgment and common sense. Theoretically, you could continue to trace root causes back to the Stone Age, but the effort would serve no useful purpose. Be careful to understand when you've found a significant cause that can, in fact, be changed.

There are three basic types of causes:

1. **Physical causes** – Tangible, material items failed in some way.
2. **Human causes** – People did something wrong, or did not do something that was needed. These causes may lead to physical causes.
3. **Organizational causes** – A system, process, or policy used for decision-making or to do the work of an organization is faulty.

Root Cause Analysis looks at all three cause types. RCA involves investigating patterns of negative effects, finding in-depth challenges/problems of the system, and discovering specific actions contributing to the challenge/problem. This often means that RCA reveals more than one potential root cause.

There are two fishbone diagrams to use with this protocol. The first is a basic fishbone diagram that allows users to enter causes in any position on the diagram. The second diagram can be more restrictive because it is designed to place category labels to help organize the information as it is entered on the diagram.

In order for all involved to understand how to complete the Fishbone, it is suggested that a facilitator model the root cause process using the attached EL example or one from your own school data. Divide your school teams into focus groups based on your highest priority challenges/problems with experts for the content of the concern. Each group would require a facilitator to fill out the fishbone based on their group's input of factors and causes. This will allow a school to address multiple instructional challenges/problems simultaneously.

Steps to Complete Fishbone (*basic diagram*):

1. **Define the challenge/problem.**
 - Select instructional challenge/problem based on prioritized needs.
 - Describe challenge/problem in the "fish head" on right hand side of diagram.

General brainstorming:

- Team members hypothesize causes for the defined challenge/problem:
Why are our children performing the way they are?
What in our systems and practices is causing our children to perform in this way?
- Be sure to list all factors and suggested causes related to the problem.

2. Once brainstorming is complete:

- Label each factor either “S” for student or “A” for adult, based on whether the factor is based on student or adult action (or lack of action) Consider crossing out all of the “S” factors, or include the adult action required to change the student action.
- Label each one “I” for In Our Control or “O” for Out of Our Control. Cross out all the “O” factors.
- Determine if control is at the district, school, or classroom level. Cross out all potential causes whose control is centered outside the school.

Steps to Complete Fishbone (*restrictive diagram*):

Label the five available categories label boxes with appropriate descriptors for the identified instructional challenge/problem. Potential categories might include:

- Curriculum
- Instruction
- Assessment
- Equity
- Professional Development
- School Culture
- Classroom management
- Data System

This helps the team identify and organize various driving factors within members’ control as they complete step 2.

To dig deeper into root cause analysis, consider the following questions:

- For each cause considered for inclusion on the fishbone diagram, ask the following questions to ensure the “cause” is supported by evidence.
- Is it measureable?
- Do I have **at least one source of data** to suggest the cause exists?
- What proof do I have that the cause actually contributed to the problem I’m looking at?
- Is there research evidence suggesting the cause will result in stated effect?
- Ask, “If . . .(cause). . ., then . . .(effect). . .”
- Is anything else needed, along with this cause, for the stated effect to occur?

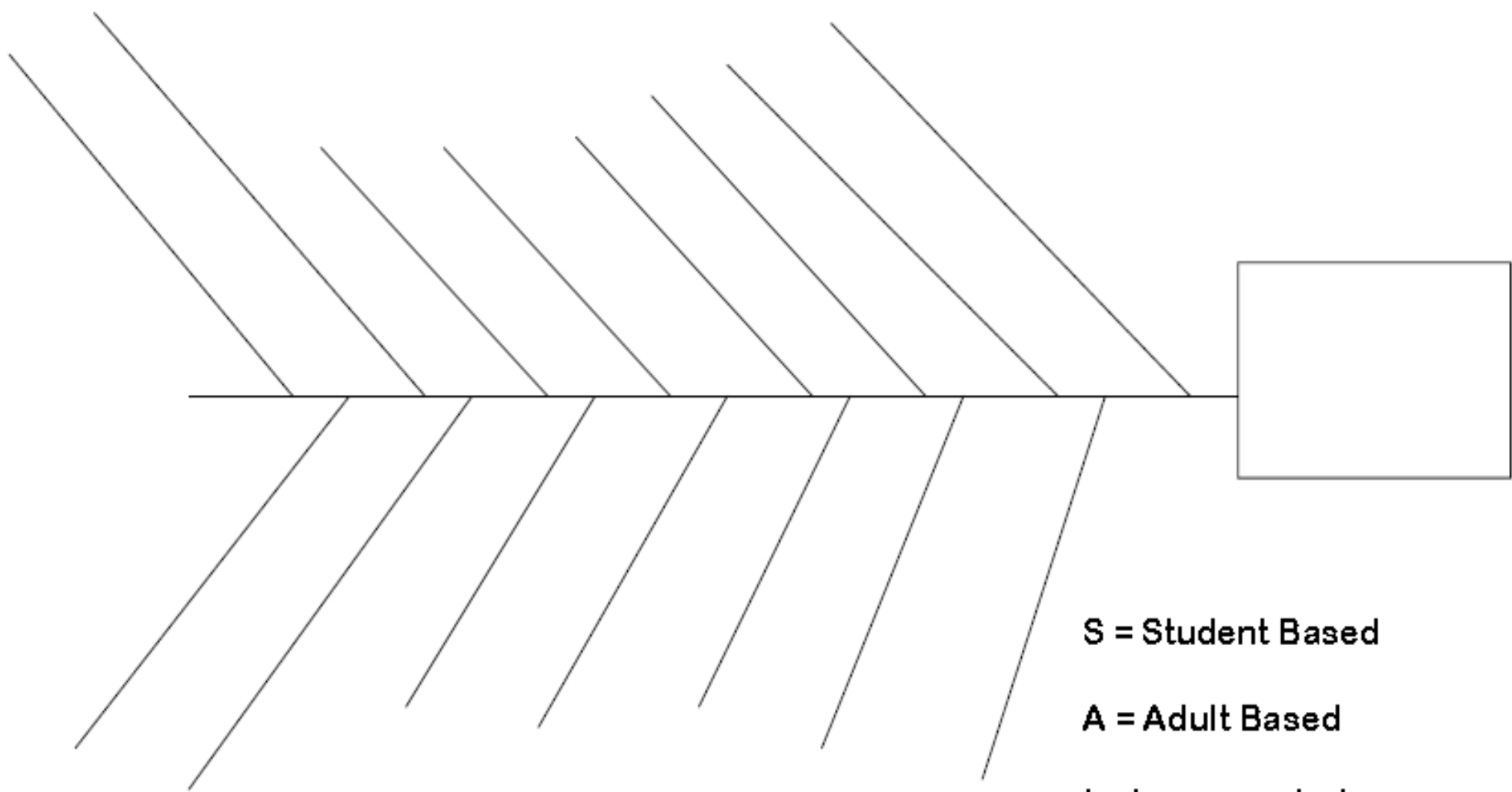
The Hypotheses/Evidence tool is helpful in determining if the data actually supports the cause.

- Be aware that the data may tell you a different story than what you had thought and also, you may find data that create another factor to add to your fishbone.

After completing the Fishbone (Cause and Effect) Diagram, complete these tasks:

- Find themes repeated within or across categories.
- Rank order the causes that the team can directly change based on the impact that each cause has on the identified key challenge or effect.
- Make sure the school has the capacity to address the root cause.

Cause and Effect (Fishbone) Diagram



S = Student Based

A = Adult Based

I = In our control

O = Out of our control

Fishbone (Cause and Effect) Diagram

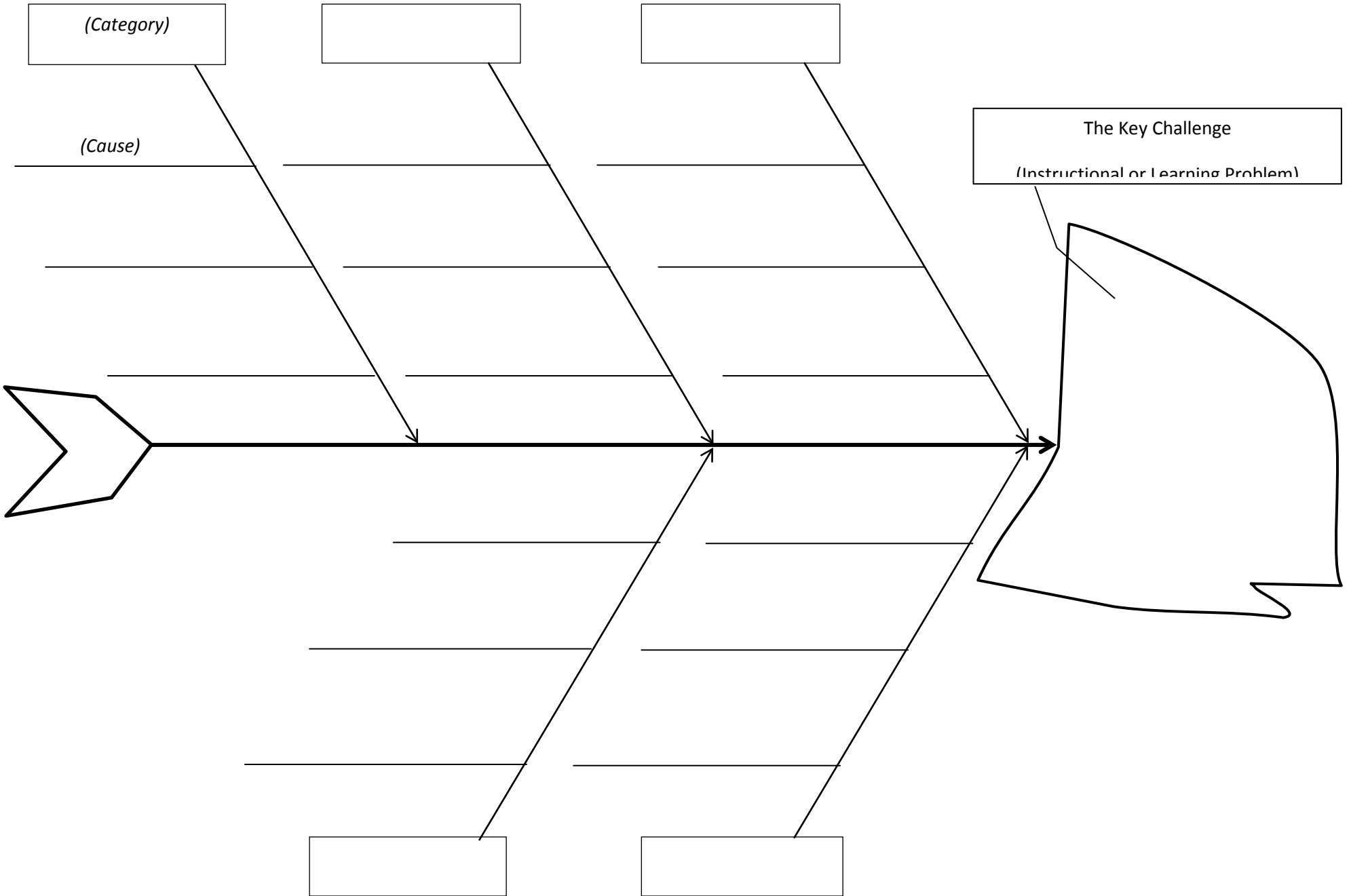
Find the Root Cause

(Category)

(Cause)

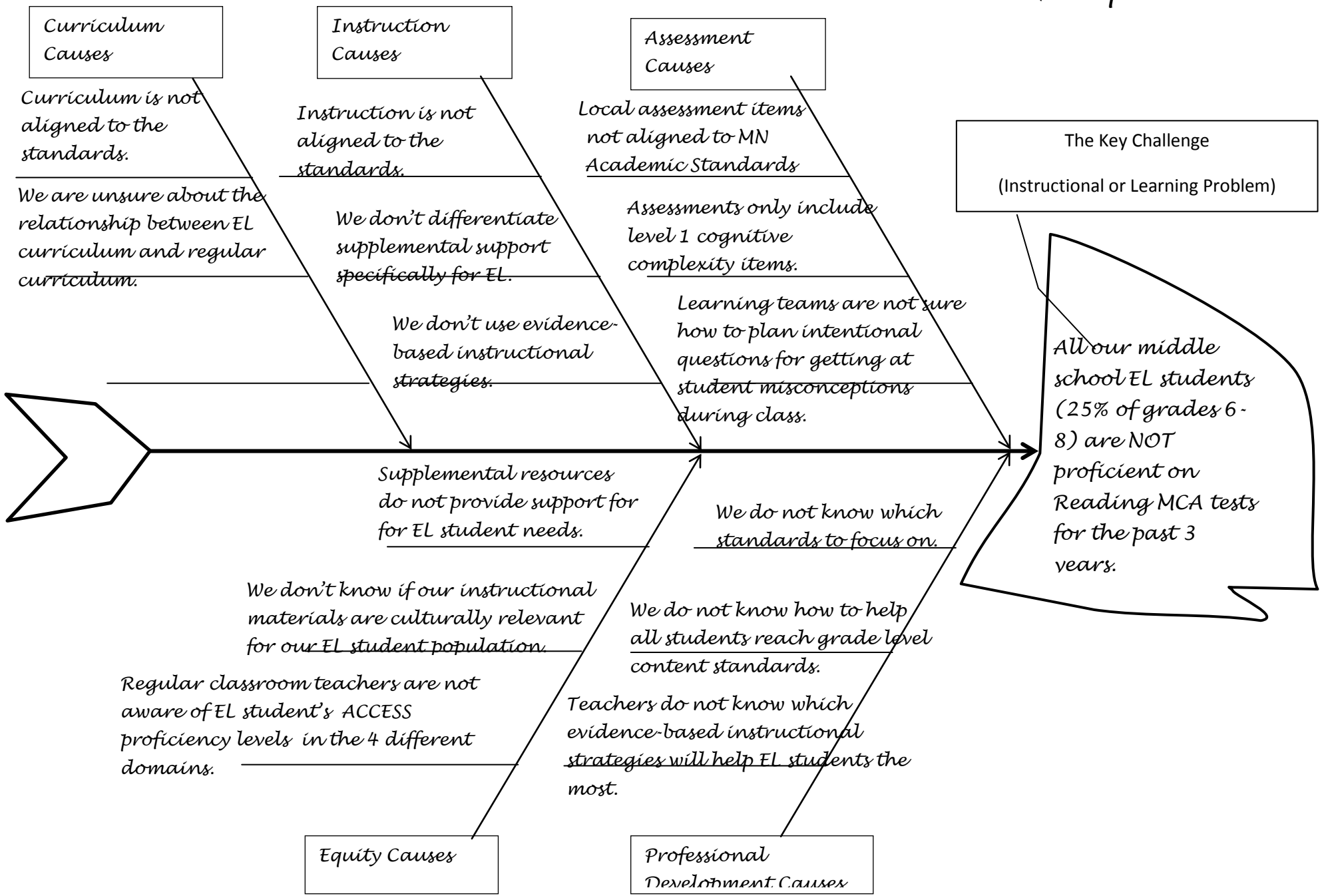
The Key Challenge

(Instructional or Learning Problem)



Fishbone (Cause and Effect) Diagram

Example



Hypothesis Setting and Evidence review

Formulating questions in response to the data (e.g., Why are our fifth-grade students proficient in Language Arts, but grades three, four, and six are not?) and considering responses to these questions, often by consulting additional data, may lead to possible explanations for observed data patterns. These explanations are *hypotheses*.

- Guiding Questions for Generating Hypotheses:
 - Why are our children performing the way they are?
 - What in our systems and practices is causing our children to perform in this way?
- First Steps:
 - Set ground rules. Team members will have their ideas and biases about why things are the way they are. Determine ground rules and enforce them.
 - Record hypotheses, document evidence, and accept or reject them.

SAMPLE HYPOTHESIS SETTING	
Identified Problem or Success: <i>Achievement levels in math drop grade by grade until they are at very low levels in Grades 6, 7, and 8. They pick up only slightly from Grades 9 to 12.</i>	
Hypothesis/ Cause	Evidence (in support, or to the contrary)
There are more special education students each year in regular classes, and they pull our scores down.	REJECT. We checked special ed enrollments. They do increase from Grades K–3, but stabilize until Grade 6, and then decline to Grade 12.
Our math teachers in the intermediate and middle levels have not had the proper training to teach the current math standards.	ACCEPT AS A POSSIBILITY. We looked at the licenses, and the teachers do have appropriate credentials. However, we looked at the sequence and record of professional development activities, and our district has provided no math professional development in 10 years.
Our standards are just too high. The tests are just too difficult, year by year.	REJECT. We looked at test results nationally and in neighboring districts. Although mathematics performance is low nationally and statewide, our performance is particularly low compared to our neighbors and to the national sample. We have also studied the items and concur that the items are fair for the grade levels assessed.



HYPOTHESIS SETTING for ROOT CAUSE

Identified Problem or Success:

Hypothesis	Evidence (in support, or to the contrary)

