

# DOINGWHATWORKS



SAMPLE MATERIAL

## Problem Analysis and Intervention Design Worksheets

Cornell Elementary School, Iowa

**Topic:** Response to Intervention in Elementary-Middle Math

**Practice:** Screening and Monitoring

The Iowa Department of Education's Instructional Decision Making (IDM) framework supports a systemic process of using data to match instruction and/or curriculum to student need. Heartland Area Education Agency (AEA) 11 has trained staff at Cornell Elementary School to support implementation of this schoolwide framework, and the school uses the agency's e-manual to support professional development.

Module Four of the manual provides a decision-making framework at each level of Iowa's problem-solving approach and guides staff development. Diagrams and worksheets<sup>1</sup> related to problem analysis design and intervention plan design can help schools develop a decision-making process for planning data-driven instruction.

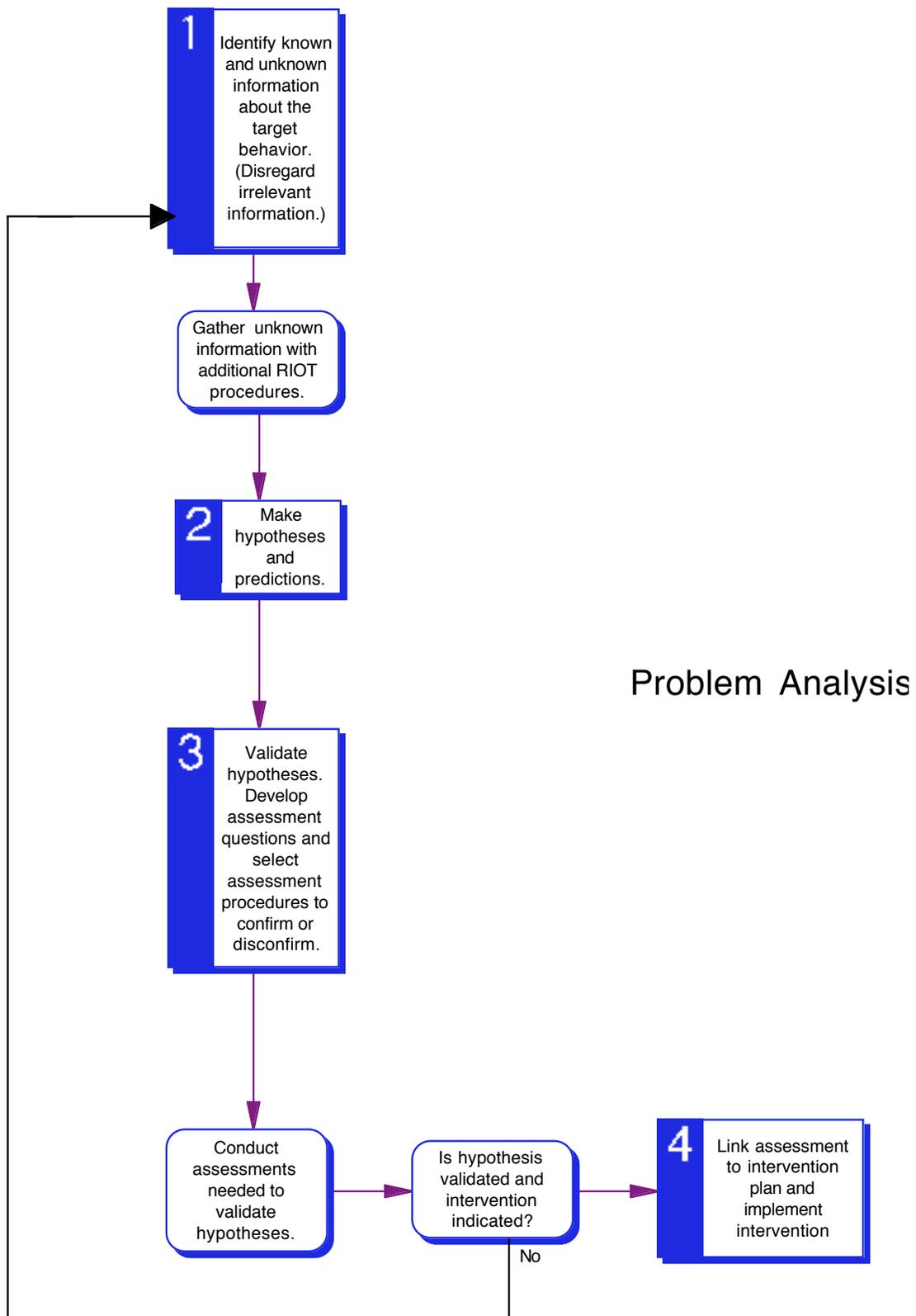
The diagrams outline each design process and the tables that follow provide guidance on implementing each practice. The *Problem Analysis*

<sup>1</sup> Heartland Area Education Agency (AEA) 11. (2007). *Special education procedures, module four: Decision-making processes, 2007-08 (Improving children's educational results through data-based decision-making)*.

*Worksheet* outlines four steps in assessing student learning:

1. Gathering information,
2. Identifying why the problem is occurring,
3. Validating hypotheses, and
4. Linking assessment data to intervention.

An assessment summary form guides analysis of indirect assessment and direct observation data. A mathematics example is provided to show how the worksheet is used. The *Intervention Design Worksheet* takes schools through a process of creating data-driven instructional plans and includes forms for recording student performance and instructional changes. The worksheet also contains two Intervention Plan forms, one a completed sample and the other blank. To learn more about problem analysis and intervention design and to view other steps in the decision-making process, download the e-manual at <http://www.aea11.k12.ia.us/spedresources/ModuleFour.pdf>.



\*Excerpted from Heartland Area Education Agency (AEA) 11, Special Education Procedures, Module Four: Decision-Making Processes, 2007-08 (Improving Children's Educational Results through Data-Based Decision-Making).

Step or Element	Fully Acceptable Practice	Partially Acceptable Practice	Unacceptable Practice
<b>Fact Finding</b>	Data are gathered on relevant alterable variables. A variety of assessment procedures are utilized (RIOT) across the domains of Curriculum, Instruction, Observations, and Tests.	Data are gathered on relevant alterable variables, but the scope of assessment is narrow in use of RIOT and assessment across domains.	The focus of the analysis is not on alterable or relevant variables.
<b>Develop Assumed Causes</b>	Data gathered through fact finding are the basis for development of statements about why the behavior is occurring with predictions about what will address behavior.	Hypotheses/prediction statements have no connection to facts collected through prior steps of the problem solving process.	No hypotheses or prediction statements are generated.
<b>Validate Assumed Causes</b>	Valid reliable assessment procedures are used that either confirm or disconfirm the hypotheses or predictions.	Assessment procedures are not appropriate to answer the questions. Hypotheses are not confirmed or disconfirmed with assessment procedures used.	No assessments are conducted to confirm or disconfirm the hypotheses and predictions.
<b>Link to Intervention</b>	An intervention is indicated that is directly linked to validated prediction.	An intervention is indicated the has some connection to the hypotheses, but does not directly link to prediction.	No intervention is indicated.

Appendix B

**Problem Analysis Worksheet**

**Name** \_\_\_\_\_

**Date** \_\_\_\_\_

**Target Behavior** \_\_\_\_\_

**Step One**

Gather Known and Unknown Information

What do you know about the behavior of concern in each of the following domains?

Environment:
Curriculum:
Instruction:
Learner:

What additional information do you need to generate hypotheses? (Survey Level Information)  
Questions:

Data Collection Results:

**Step Two**

Based on the data you have collected, why do you think the problem is occurring? And what is the predicted result of actions you might take?

Hypotheses	Predictions

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**Step Three**

Validate Hypotheses What questions need to be answered to confirm or disconfirm your hypotheses?

Data collection results:

**Step 4**

Link Assessment to Intervention  
Intervention Recommendations:

\*Excerpted from Heartland Area Education Agency (AEA) 11, Special Education Procedures, Module Four: Decision-Making Processes, 2007-08 (Improving Children's Educational Results through Data-Based Decision-Making).

### Functional Assessment Summary Form

Student: \_\_\_\_\_

Date: \_\_\_\_\_

Completed by: \_\_\_\_\_  
\_\_\_\_\_

Definition of problem behavior:			
Possible chain of behavior:			
	Indirect Assessment	Direct Observation	Functional Analysis
Brief description of assessment:			
Occurrence of behavior:			
Nonoccurrence of behavior:			
Consequences:			
Hypothesis:	Function:  Antecedent:  Consequences:	Function:  Antecedent:  Consequences:	Function:  Antecedent:  Consequences:
The problem occurs because...			
The behavior will be reduced if...			

**Problem Analysis Worksheet**

**Name David Hanson**

**Date July 26, 2000**

**Target Behavior Math Application – Solving Word Problems or Real Life Problems**

**Step One**

What do you know about the behavior of concern in each of the following domains?

**Environment:**

Math is taught in large group of approximately 25 students. Assignments are given daily. Some time to work independently is provided each day. David typically does not complete any work during this time. The classroom is quiet and very structured.

**Curriculum:**

Heath Mathematics curriculum materials are used. The teacher supplements these materials with computer program – Sequences – to provide practice on basic computation skills. Heath materials provide review of basic skill with each lesson as well as an application activity with each lesson. In 5<sup>th</sup> grade, students are expected to know all basic facts.

**Instruction:**

Daily instruction includes modeling and guided practice. Feedback is provided on daily homework assignments and through weekly quizzes. David receives extra instruction after school as part of “Math Club” one time per week. This instruction is not consistent with classroom.

**Learner:**

David’s ITBS Scores Fall 1999, Math 6<sup>th</sup> Percentile, Language 35<sup>th</sup> Percentile, Reading 23<sup>rd</sup> Percentile. David appears to be engaged in learning activities during math.

What additional information do you need to generate hypotheses? (Survey Level Information)

**Questions:**

1. Are David’s reading skills interfering with completion of math application problems?
2. How do David’s math skills compare to peers?

**Data Collection Results:**

1. David reads 123 words per minute compared to typical peers who read 155 words per minute. When application problems were read to David, his performance remained the same. Reading does not appear to be interfering.
2. David’s math application scores using CBM (MBSP Probes) 0 problems correct per 5 minutes compared to peers 8 problems. Computation 13 digits correct compared to peers 28 digits correct.

**Step Two**

Based on the data you have collected, why do you think the problem is occurring? And what is the predicted result of actions you might take?

<p>Hypotheses - The problem is occurring because: David does not have basic computational skills necessary to do application problems</p>	<p>Predictions – The problem will be reduced if: Teach computational skills Use a calculator when doing math application problems</p>
<p>David does not have content knowledge needed to do math application skills</p>	<p>Teach content knowledge</p>

### **Step Three**

Validate Hypotheses - What questions need to be answered to confirm or disconfirm your hypotheses?

Does David know basic facts? Survey facts

Which operations can David perform accurately? Survey Operations

Does David know time, temperature, measurement, money? Asses content knowledge

Data Collection Results:

Addition 66 digits correct – peers 70 digits

Subtraction 50 digits correct – peers 69 digits

Multiplication 28 digits – peers 67 digits

Division 33 digits – peers 56 digits

David was accurate on multiplication facts to 5 or involving divisors below five.

Computation Survey – David accurately completed addition and subtraction problems. He made errors on all multiplication, division, fractions, and decimals

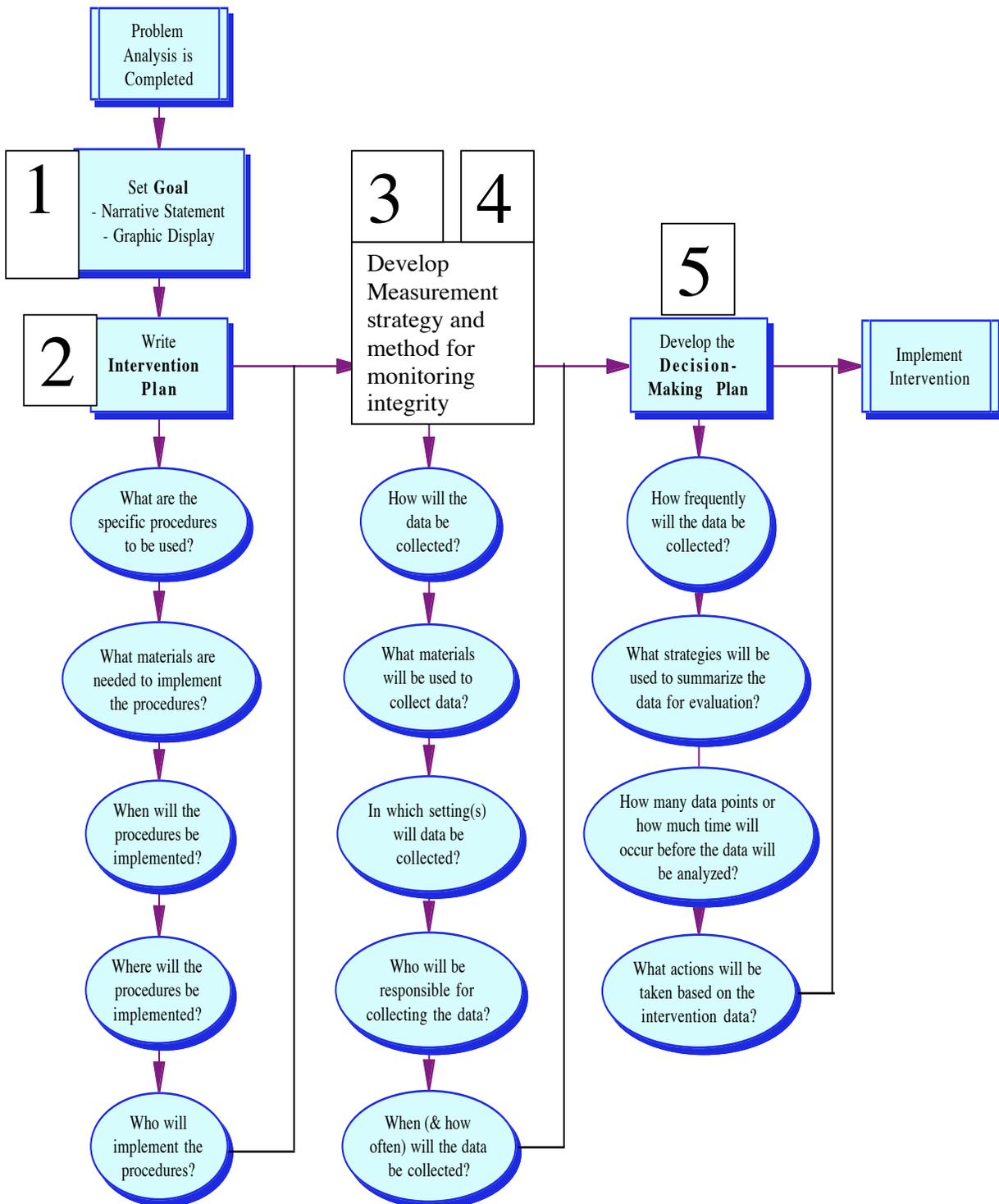
Further analysis was done in multiplication and division computation. David's errors were fact errors, placement errors, and algorithm errors (in long division)

Content knowledge assessment indicated good content knowledge. so use of accommodation was investigated.

Application score with calculator 90% accurate, without calculator 30% accurate.

### **Step 4** Link Assessment to Intervention – Intervention Recommendations:

David needs fluency instruction on basic multiplication and division facts. This can best be accomplished by giving him an opportunity to practice facts and record his own progress. Positive reinforcement should be provided for accomplishments. In addition to fluency instruction, he needs accuracy instruction on basic operations correcting the error patterns identified in the analysis. Finally, he needs to be given the accommodation of using the calculator when working application problems.



## Intervention Design: Decision Making

\*Excerpted from Heartland Area Education Agency (AEA) 11, Special Education Procedures, Module Four: Decision-Making Processes, 2007-08 (Improving Children's Educational Results through Data-Based Decision-Making).

**Intervention Design**

<b>Step or Element</b>	<b>Fully Acceptable Practice</b>	<b>Partially Acceptable Practice</b>	<b>Unacceptable Practice</b>
<b>Set Goal</b>	Goal stated narratively and represented graphically on performance chart specifying time frame, condition, behavior, and criterion.	Goal stated narratively specifying time frame, behavior, criterion, and condition — not represented graphically.	Goal not set.
<b>Develop Intervention Plan</b>	Plan stated (a) procedures/strategies, (b) materials, (c) when, (d) where, and (e) persons responsible.	Generic description of intervention strategy (e.g., behavior management) is stated. Materials, when, where, and persons responsible may be present.	Intervention plan not written. OR Generic descriptions of intervention (e.g., behavior management) only.
<b>Select Measurement Strategy</b>	A measurement strategy is developed answering how? What? Where? Who? And when?	A measurement strategy is developed but only answers three of the five questions: how? What? Where? Who? And when?	Measurement strategy is not developed. OR The measurement strategy only answers one or two of the five questions.
<b>Plan to Monitor Treatment Integrity</b>	A plan to monitor implementation integrity is written including method for monitoring, who is responsible, and how often.	A nonspecific plan is written to monitor intervention integrity	No plan to monitor implementation integrity is included.
<b>Develop Decision Making Plan</b>	The decision-making plan indicates (a) how frequently data will be collected, (b) the strategies to be used to summarize the data for evaluation, (c) how many data points or how much time will occur before the data will be analyzed, and (d) what actions will be taken based on the intervention data.	Decision making plan does not address all five components.	No decision making plan is included

Appendix

Sample Data Driven Instructional Plan

<input type="checkbox"/> Group <input type="checkbox"/> Individual  <input type="checkbox"/> Supplemental <input type="checkbox"/> Intensive  Grade: _____	Area of Concern: <b>(Describe the skill or behavior of concern)</b>   Expected Level of Performance:
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**Data Indicating Need**

**Formative Assessment Plan**

What data will be collected and who will collect data?

When will data be collected and how often?

What materials will be used to collect data?

**Plan to Use Data for Decision Making**

How often will data be examined and by whom?

What will indicate that an instructional change is needed?

Date	Instructional Procedures	Materials/Arrangements	Times Per Week Length of Time Per Session	Persons Responsible

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**Record of Instructional Changes  
Diagnostic Information Leading to Instructional Changes**

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Date	Instructional Procedures	Materials	Times Per Week Length of Time Per Session	Persons Responsible
	<input type="checkbox"/> Supplemental <input type="checkbox"/> Intensive			

**Diagnostic Information Leading to Instructional Changes**

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Date	Instructional Procedures	Materials	Times Per Week Length of Time Per Session	Persons Responsible
	<input type="checkbox"/> Supplemental <input type="checkbox"/> Intensive			

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## Sample Intervention Plan Form

**Problem Statement:** Behavioral description of the problem; based on problem analysis

What is the target behavior? <i>(Should be specific, observable, alterable, measurable and focused within educational setting)</i>	
What about the behavior is problematic? <i>(Should address frequency, latency, intensity, fluency, or accuracy)</i>	
What is the level expected for the behavior? <i>(Based on a specific standard of acceptance)</i>	
What standard will be utilized? <i>(Consider peer comparison, curriculum, teacher, policy, etc)</i>	
What is the level of performance before intervention? <i>(Baseline or pre-treatment performance – this is a number)</i>	
What is the discrepancy between expected and actual? <i>(This defines the size of the problem now)</i>	

**Goal:** Must be measurable & observable; states direction & extent of target behavior change

Conditions: When and how the student will perform the behavior?	
Behavior: What the student will do?	
Criterion: What is the expected level of performance?	
Time-frame: What is the length of time anticipated for the student to reach the goal level?	

**Parental Participation:** This should clearly summarize the parent's engagement in the process

On what dates were contacts made to involve parent? <i>(These could be phone, personal, letters, etc)</i>	
Did parents come to meetings and/or participate in designing the intervention plan?	
Did the parents have a role in the implementation of the intervention?	

**Procedures:** These should be sound and reasonable; focused on changing the targeted behavior

What instructional procedures or strategies are to be used in the intervention? <i>(These should be procedures to address the specific problem targeted in the intervention)</i>	
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**Arrangements:** These are key logistical issues regarding what, when, where, by whom

What materials are needed to implement the procedure or strategy? <i>(Could include probes, teaching materials, resources, books, etc)</i>	
What length of time and how often will the intervention take place? <i>(Needs to be clear as to time and frequency)</i>	
Where is the intervention procedure to take place? <i>(Include location in room or building)</i>	
Who is the person(s) responsible for implementing the procedures or strategies? <i>(Be sure others are aware of their responsibility and are trained)</i>	

**Measurement Strategy :** This is where data for intervention evaluation will be obtained

What is the method of data collection? <i>(Could be point sheets, probes, observations, tallies, tokens, etc)</i>	
What are the conditions for data collection? <i>(Addresses when and how the data will be collected)</i>	
What is the schedule for data collection? <i>(This addresses how often the data will be collected under the specified conditions)</i>	
Who is responsible for data collection? <i>(This could be one or several persons)</i>	
Who is responsible for data summary or analysis? <i>(This is the person who will take the data and chart or graph it for analysis)</i>	

**Monitoring Plan:** Intervention effects will be evaluated for making instructional changes

What is the rule to be used to make decisions about the summarized data? <i>(For example trend lines or 4 point rules)</i>	
Who will monitor implementation and what will be monitored to ensure implementation?	

**Intervention Outcomes:** Ultimate decisions about intervention effects are made

What dates did the team follow-up? <i>(Should be premised on the schedule of data analysis)</i>	
Was the intervention implemented as planned?	<input type="checkbox"/> Yes <input type="checkbox"/> No
What is the level of performance after intervention? <i>(In comparison to the same original standard – this is a number)</i>	