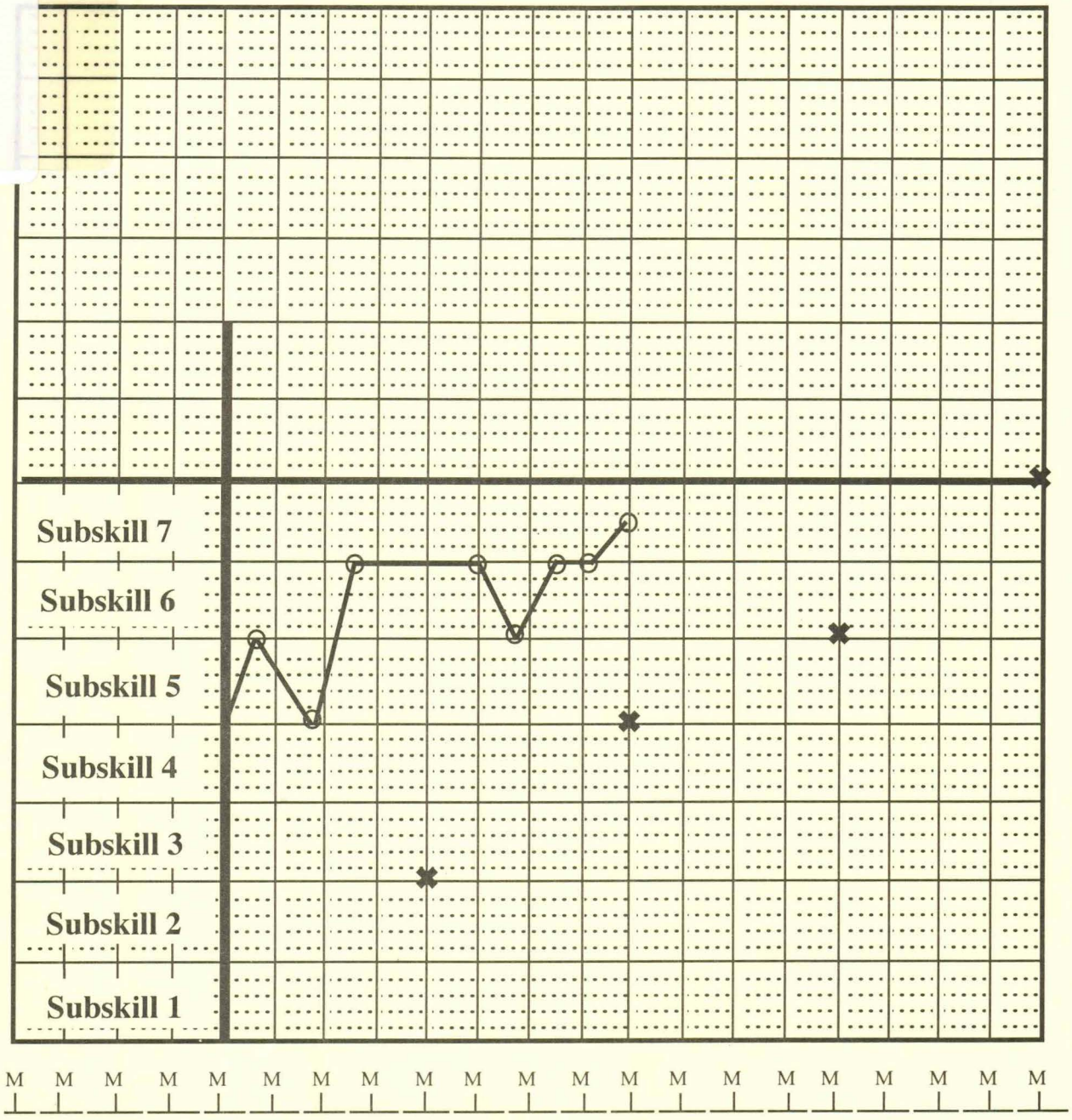
Mastery Monitoring



Iowa Department of Education
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Grimes State Office Building
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July 1997

Welcome

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Monitoring student performance using the Student Improvement is Job #1 format.

MASTERY MONITORING

A cooperative effort between:

- Local Education Agency (LEA)
- Area Education Agency (AEA)
- Iowa Department of Education, Bureau of Special Education

Table of Contents

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Introduction

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Welcome to Mastery Monitoring! We have two very simple goals for today's presentation. The first is to clarify the importance of monitoring progress and the important part you play in that process; and second, to assist you through the process of mastery monitoring, one method of monitoring student performance.

If you have questions, you may contact the following persons:

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Note Page

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Concerns or questions that you would like to make certain are addressed today:

Feel free to use this space for notes!

Agenda for Workshop

Introduction

Define the Behavior

Measurement Strategy

Current Level of Performance

Goal Setting

Charting

Decision Making

Intervention and Data Collection

Introduction

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What are the expected outcomes from today's presentation:

Participants will be able to:

- Define mastery monitoring and its purpose in instructional decision making.
- Define a terminal behavior and subskills for a mastery monitoring system.
- Develop a data collection system and convert the data to a chart.
- Apply decision making criteria based on the data collected.

Introduction

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Definition of *Mastery Monitoring*

- Mastery monitoring means monitoring student mastery of a series of subskills over time. The subskills collectively lead to a terminal behavior.

Definition of *Behavior*

- Represents the terminal behavior which is the goal.

Definition of *Subskills*

- Represents the steps in a process.

The subskills should always be functional behaviors in natural environments.

Introduction

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What is the *Purpose* of Mastery Monitoring:

To monitor individual progress toward mastery of an educationally and developmentally relevant set of skills, for the purpose of decision making.

Mastery monitoring is *SIMILAR* to Progress Monitoring:

- Use direct and frequent data collection
- Make intervention decisions on basis of student's performance
- Establish instructional aims
- Maintain record of student's performance
- Monitors progress toward long or short term goals

Introduction

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When to choose a mastery monitoring approach:

- ➟ The behavior is not present or components are missing.
- ➟ The measurement and instruction are **directly** connected, therefore sensitive to instructional effects.
- ➟ More sensitive to short term gains.
- ➟ Monitors mastery of subskills.
- ➟ Does not assess retention and generalization of related skills.

When to choose a progress monitoring approach:

- ➟ The behavior skill is present and alterable.
- ➟ Less sensitive to progress on specific subskills.
- ➟ Monitors progress toward long-term goal.
- ➟ Provides teachers/therapists opportunity to experiment with various instructional strategies and evaluate their effectiveness.

Introduction

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Mastery Monitoring is used when the concern is *ACCURACY:*

Accuracy: The behavior is either not present, missing important developmental components or needs to be shaped. There are two ways to break down a behavior:

1. **Steps in a Process**

Examples of Steps in a Process:

- Getting ready for school
- Putting on clothing
- Moving from place to place
- Managing transitions
- Using utensils to feed self
- Communicating needs and wants
- Play skills
- Interactions with people & environment

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2. Covering Content

Examples of Covering Content:

- Carolina Curriculum for Handicapped Infants
- AEPS (Assessment, Evaluation & Programming System)
- Loops and Other Groups (Handwriting)

In Summary:

Critical Components of Mastery Monitoring:

- A skill that is educationally and developmentally relevant must be identified
- Subskills for mastery monitoring must be clearly defined with specific criteria.
- Subskills are discrete entities.
- Subskills should always be functional skills in natural environments.
- Data are collected on same skills as instruction.

Introduction

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What are some situations for which you would choose this type of monitoring system?

- _____
- _____
- _____

Refer back to page 4 —have some of your questions been answered?

Other questions you might have:

_____
_____
_____
_____
_____
_____
_____
_____

Feel free to use this space for notes!

Case Study

Let's introduce a case study and relate it to the material covered at this point.

Note Page

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Define the Behavior

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The *behavior* is defined as a:

- Series of subskills

  OR

- Listing of curricular content

  . . . . which leads to a terminal behavior.

The behavior must be:

- Specific
- Observable
- Alterable
- Measurable

Primary focus is on the analysis and sequencing of skills to be measured that are unique and child specific. Specification of the subskills sequence is crucial, since it is the basis for measuring student mastery of the educationally and developmentally relevant behavior(s).

Define the Behavior

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Must pass the "So What?" Test.

***So what* if one can stack blocks?**

***So what* if one has sideways protective extension when pushed?**

Identify a behavior that is:

- Meaningful to family and other team members
- Unique to child
- Subskills unique to overall task
- Unique to environment
- Behavior valued in and of itself

Avoid using:

- Cookbook approach for all behaviors or tasks
- Listing tasks from developmental checklists or assessments
- Standard task analyzed behaviors

Define the Behavior

Feel free to use this space for notes!

Steps in *Defining* the behavior:

1. Select the behavior
2. List the unique subskills to be mastered
3. Establish a sequence (if appropriate) of the subskills
4. Record on Job #1 Chart

1. Select the behavior:

- Ask the questions-
  - What can the student do?
  - What does the student need to learn to do next?
  - Is the behavior specific, observable, alterable and measureable?
- Write the behavior to be learned on the chart.

Definition of Behavior (Behavior [which is specific, observable, alterable and measurable] is defined, then three examples and three non examples are provided.)

Dimension of Behavior (What about the behavior is problematic?) _____

- Behavior happens too much or too little (Frequency)
- Behavior happens too long or too short (Duration)
- Behavior doesn't happen correctly (Accuracy)
- Behavior takes too long to begin after a prompt (Latency)
- Behavior occurs but is inappropriate or inefficient (Topography)
- Behavior is too loud, forceful, or too soft, passive, etc. (Intensity)

Behavior DISCREPANCY BEFORE Intervention

- What is the student's current level of performance, the baseline? _____ (A)
- What level of student performance would be acceptable? _____ (B)
- What is the discrepancy between the level of A and B? _____ (C)

- What standard is used to determine the acceptable level of performance in Item B: _____

Standards: • Local norms • Peer performance • Criteria for the environment • Instructional placement standards • Developmental standards • Teacher expectation • School policy/standards • Medical • Other (please specify)

Define the Behavior

Feel free to use this space for notes!

Now for step two.

2. List unique subskills to be mastered:

- Identify the subskills of the behavior
- Determine subskills that are easy to observe and measure
- Determine the number of subskills needed to reflect meaningful progress
- Record subskills on Job #1 Chart

Now on to step three.

3. Establish a sequence of subskills:

Ask the questions:

- Are they arranged in a logical way for instruction?
- Does the sequence avoid large "jumps" that would cause difficulty for the learner?
- Does the sequence include a sufficient breakdown of steps for the individual student?
- If all subskills are mastered, will the behavior be accomplished?

Now for the last step:

4. Record subskills under Definition of Behavior

Define the Behavior

Feel free to use this space for notes!

Another example:

Definition of Behavior (Behavior [which is specific, observable, alterable and measurable] is defined, then three examples and three non examples are provided.)

Behavior: **Mastering social domain (AEPS)**

Subskills: **Interactions with adults**

a. initiates social game with familiar adult
b. responds to adult's goodbye
c. initiates communication using gestures or vocalizations

Interaction with environment

a. requests help with clothing when toileting
b. with cue, performs behavior associated with established routine (bedtime, toileting or dressing)

Interaction with peers

a. responds to other children during freeplay
b. maintains communication exchange toward peer with verbalizations

Dimension of Behavior (What about the behavior is problematic?)

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Note Page

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Measurement Strategy

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1. Establish mastery criteria for each subskill:

Ask the questions:

- Does it match typical home and/or school routines?
- Does it meet the unique needs of the individual student?
- Does it address the nature of the subskill?
- Does it focus on mastery?
- Is it feasible to measure easily?

2. Dimension of the behavior: Accuracy

Definition of Behavior (Behavior [which is specific, observable, alterable and measurable] is defined, then three examples and three non examples are provided.)

Dimension of Behavior (What about the behavior is problematic?) Accuracy

- Behavior happens too much or too little (Frequency)
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Measurement Strategy

Feel free to use this space for notes!

3. Implementation logistics

a. Persons responsible for doing the actual data collection during instruction?

- Practitioner
- Parent
- _____
- _____

b. Methods of data collection during instruction.

Two methods:

1. Data collection sheet
2. Performance Probe (Test) Data

Both methods are formative measures and permanent products.

Differences between the two methods:

1. Data collection sheets
   - Information gathered through observation
   - Encompasses all the steps in the process

2. Performance Probe (Test) Data:
   - Covers the content of **each** subskill
   - Constructed for each subskill
   - Used primarily for academic behaviors

Measurement Strategy

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There are two types of data that can be collected during instruction.

Quantitative data documents data over time and tells you if you are on track; whereas, the qualitative data documents short term feedback on the subskills and interventions (identifies if they are learning these subskills).

Quantitative Data

- Performance on subskills
- Performance on terminal behavior

Qualitative Data

- Anecdotal data
- Error data

Measurement Strategy

Feel free to use this space for notes!

c. Measurement conditions.

Same as teaching conditions in mastery monitoring.

d. Monitoring schedule (frequency of data collection per week)?

- Gather data on a regular and frequent basis
- Schedule of data should match unique needs of child, task and environment.

4. Record on Job #1 Chart

Intervention Considerations

Beginning Date ___/___/___ (Mo/Day/Yr) Direction of Change (I,D,M) _____ (Increase, Decrease, Maintain) Intervention Mode _____ (Developmental, Supplemental, Generalization)

Measurement Strategy **(Who's responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule--frequency of data collection per week)**

Current Level of Performance

Feel free to use this space for notes!

Current Level of Performance (CLP)

CLP is based on the following assumptions:

- Knowledge of the student by the team including the family
- Skill is not present, missing important developmental components, or needs to be shaped
- Acceptable level of performance is mastery of all subskills
- Behavior discrepancy in this model is the difference between the CLP of zero and the identified number of subskills. (The baseline is assumed to be zero.)

Steps for Current Level of Performance

1. Review criteria established for subskills
2. Identify and record overall standard used to determine acceptable level of performance.
3. Record CLP & behavior discrepancy on Job #1 chart.
4. After 3-5 days of measurement, ask these questions:
    a. Are these the appropriate subskills?
    b. Are they in a logical sequence?
    c. Do I need to make any adjustment?
    d. Was the performance standard appropriate?
5. Revise subskills and chart if needed—this is your baseline.
6. Document review of subskills on front of charts.

Current Level of Performance

Feel free to use this space for notes!

Example:

Definition of Behavior (Behavior [which is specific, observable, alterable and measurable] is defined, then three examples and three non examples are provided.)

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Standards: • Local norms • Peer performance • Criteria for the environment • Instructional placement standards • Developmental standards • Teacher expectation • School policy/standards • Medical • Other (please specify)

Goal Setting

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Children can hit any target they can see and will hold still for them. Author unknown

Goal is defined as:

The performance of the terminal behavior. The subskills are only a means to the terminal behavior. The terminal behavior represents the end product.

Goal

- Represents accuracy and skill mastery over time
- Represents completion of all the subskills
- Represents maintenance of subskills over time

Steps in Goal Writing

1. Determine the terminal behavior.
2. Identify measurable criteria
3. Write goal using standard format on Job #1 chart

Goal Setting

Feel free to use this space for notes!

Standard Format

In **time** when **conditions** **name of student** will **behavior criterion.**
(criterion is the completion of subskills and overtime)

In 20 weeks when given a snack, Jonah will use a spoon to feed himself following all the steps of the subskills for 5 consecutive days.

Goal Setting

Feel free to use this space for notes!

Student Improvement is Job #1: Goal Area _____

Student's name _____ District _____ School _____School Year ___ Teacher _____

Goal Statement: _____

_____

_____

Subskill 7																				
Subskill 6																				
Subskill 5																				
Subskill 4																				
Subskill 3																				
Subskill 2																				
Subskill 1																				
M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Note Page

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Charting

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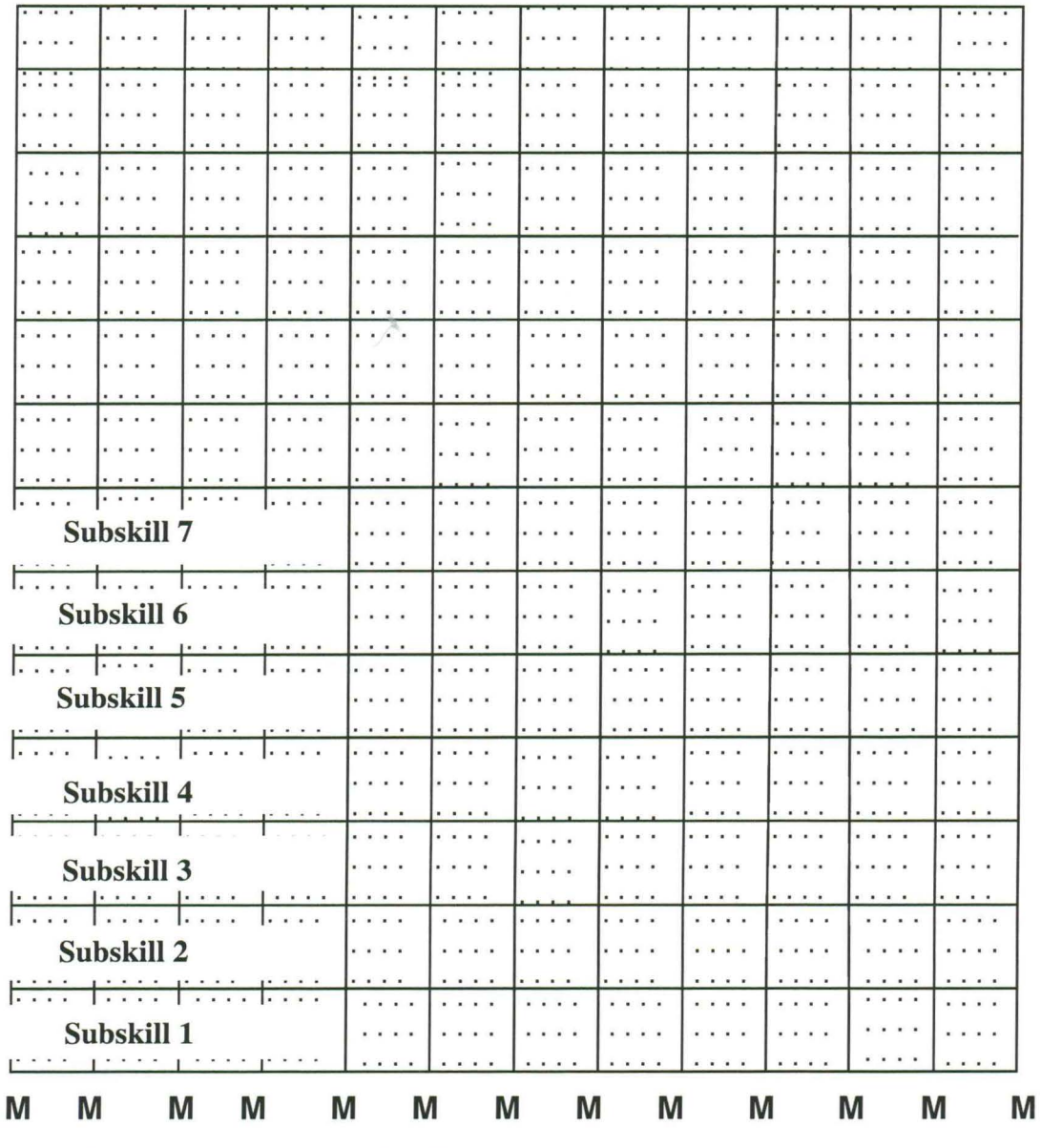
Steps to setting up a chart:

✔1. Write the goal on the chart
2. Transfer the subskills to the chart
3. Label the horizontal axis
4. Label the vertical axis
5. Draw goal line
6. Draw quarter stars
7. Write data recording system (key)

2.



Charting

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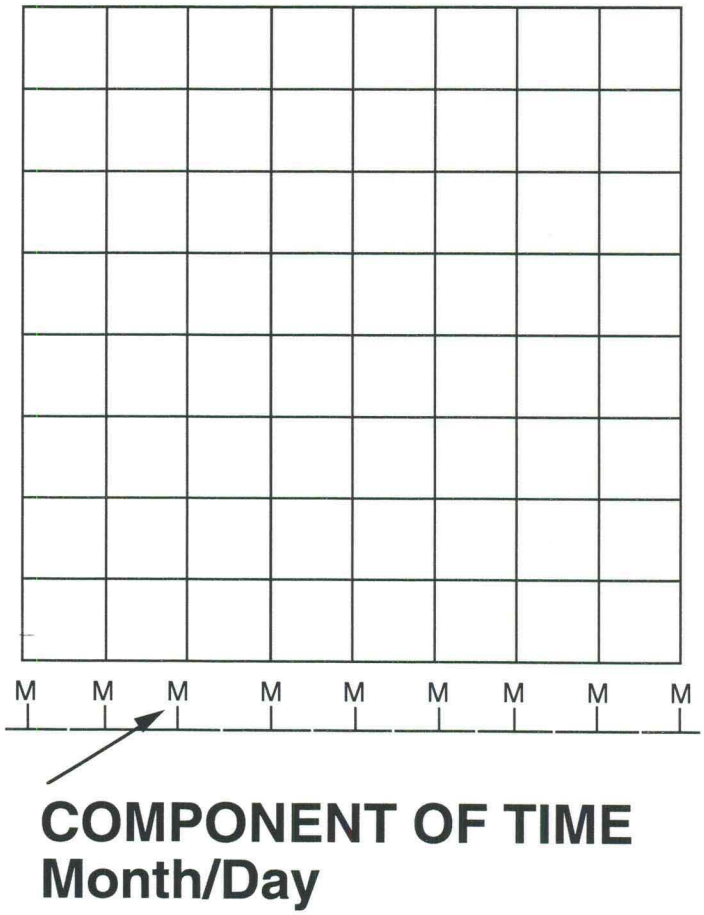
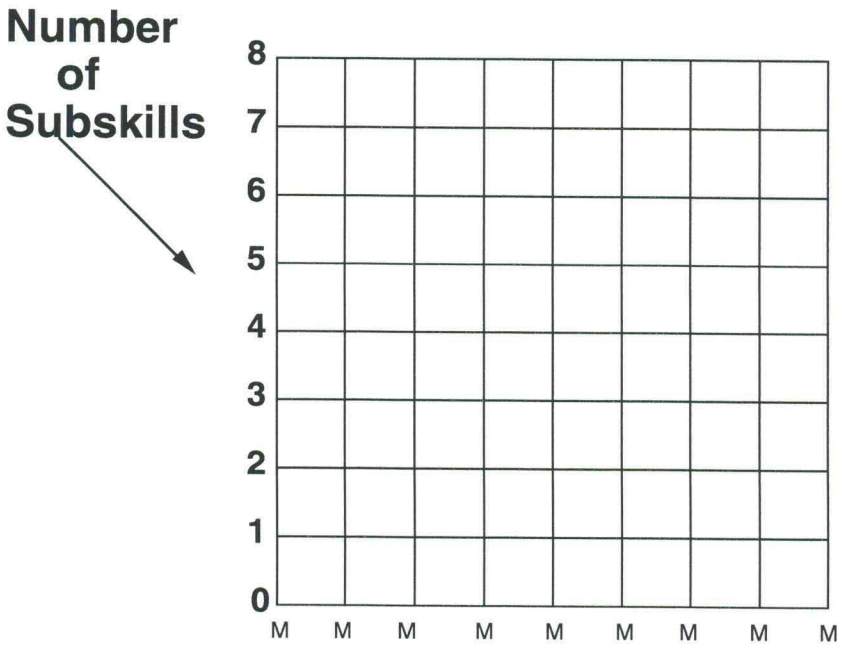
3. Label horizontal axis



4. Label vertical axis



Charting

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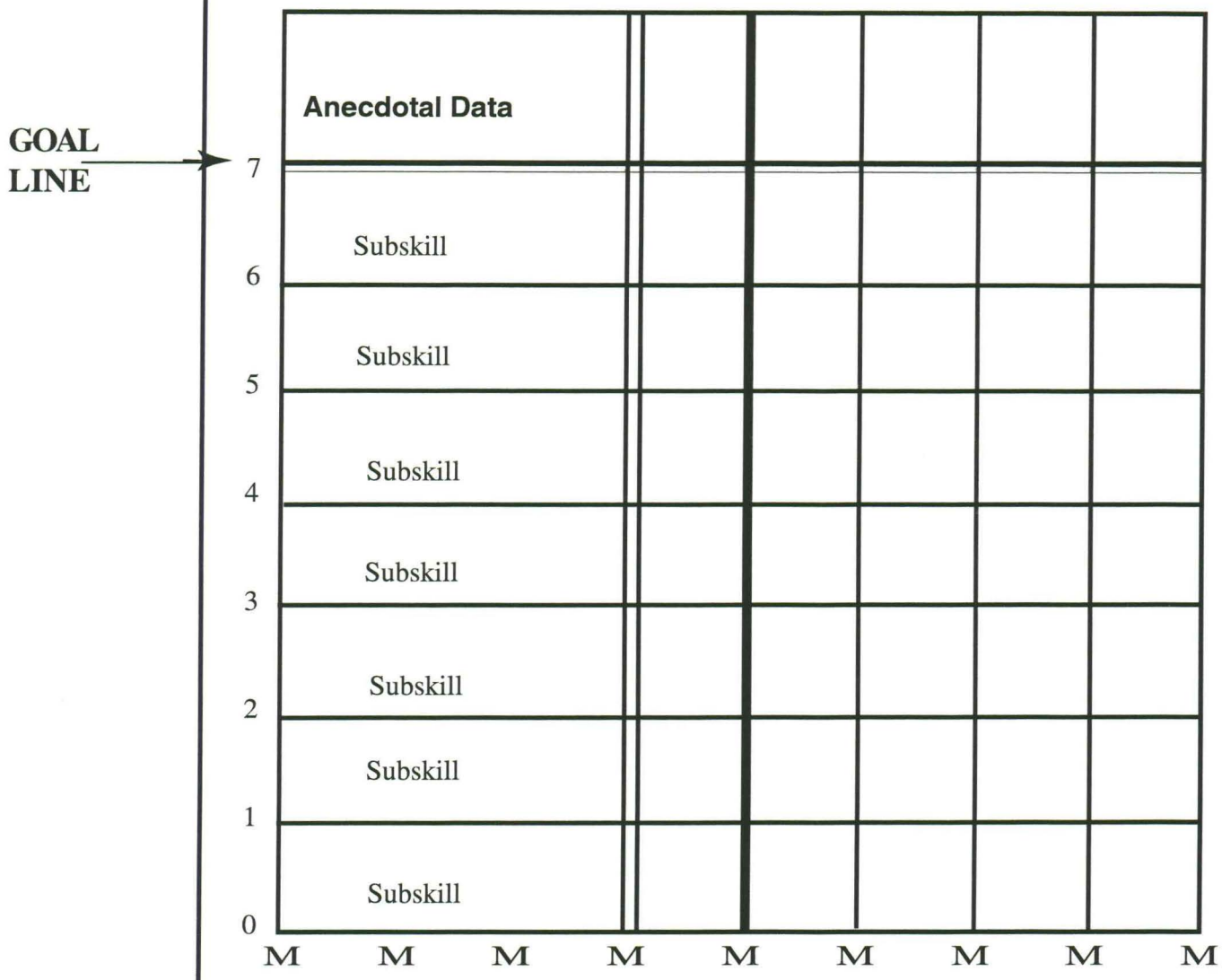
5. Draw a Goal Line
   (Flat line at the goal level)
   Draw a double line to separate subskills from data (baseline)
   Draw decision line after subskills review



Charting

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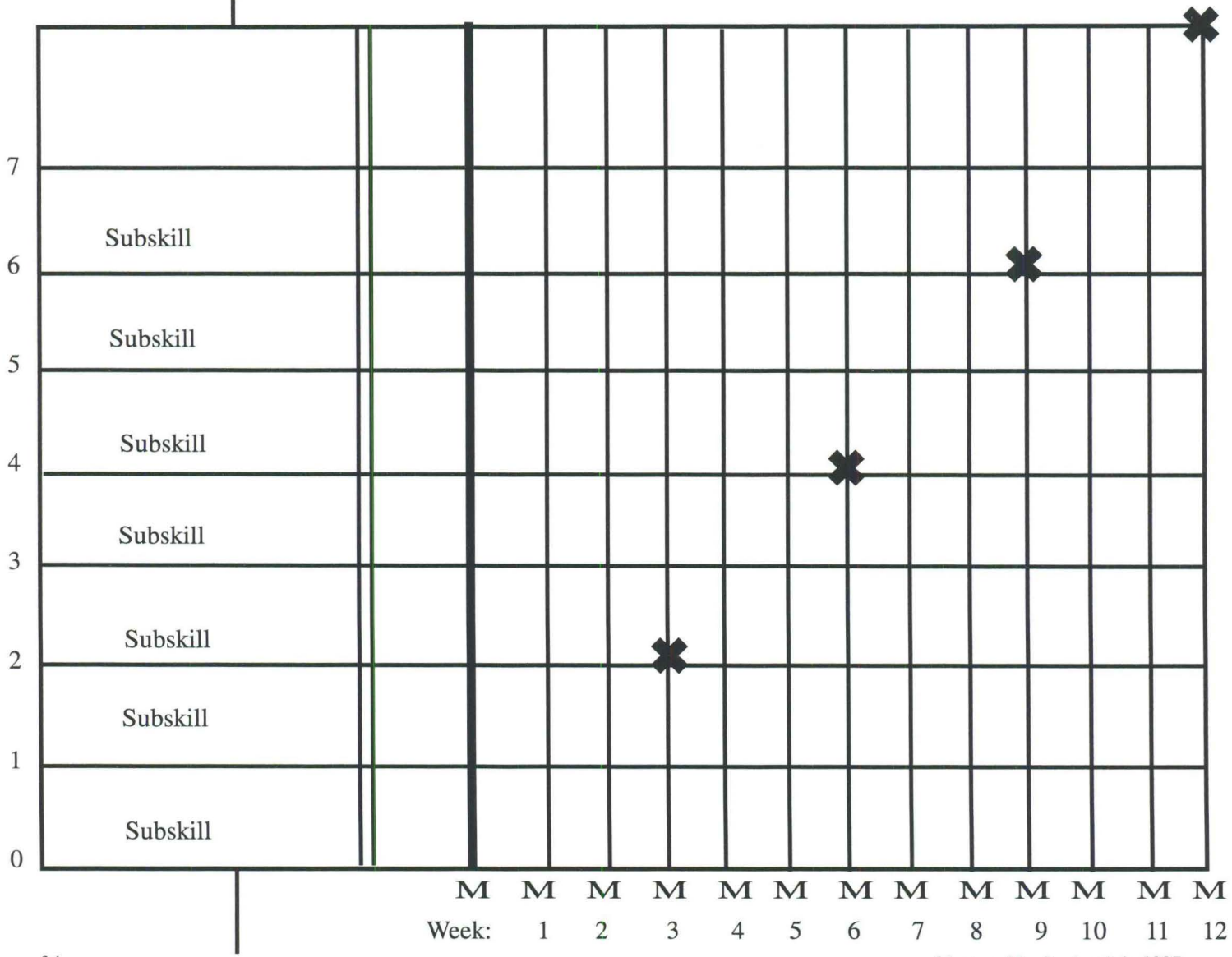
6. Draw Quarter Stars

Quarter stars:

- Provide a benchmark
- Help determine progress
- Aid in decision making
- Represent quarterly objectives
- Represent the expected rate of progress toward the goal



Charting

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Process for Drawing Quarter Stars:

Step 1: Determine the number of weeks in goal and divide in fourths

Step 2: Determine the number of subskills and divide in fourths

Step 3: Plot the intersections of the quarterly weeks with the quarterly subskills

In 20 weeks when given a snack, Jonah will use a spoon to feed himself . . .

Step 1 - Determine the number of weeks in goal and divide in fourths.

Determine the weekly interval

20 weeks

20 weeks divided by 4 = 5

Interval is 5 weeks

Week 5 - 1st objective

Week 10 - 2nd objective

Week 15 - 3rd objective

Week 20 - goal criterion

Charting

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Step 2 - Determine the number of subskills and divide in fourths

- Determine the number of subskills in goal
- Divide by 4

7 divided by 4 = 1.75

Obj. 1 = 1.75

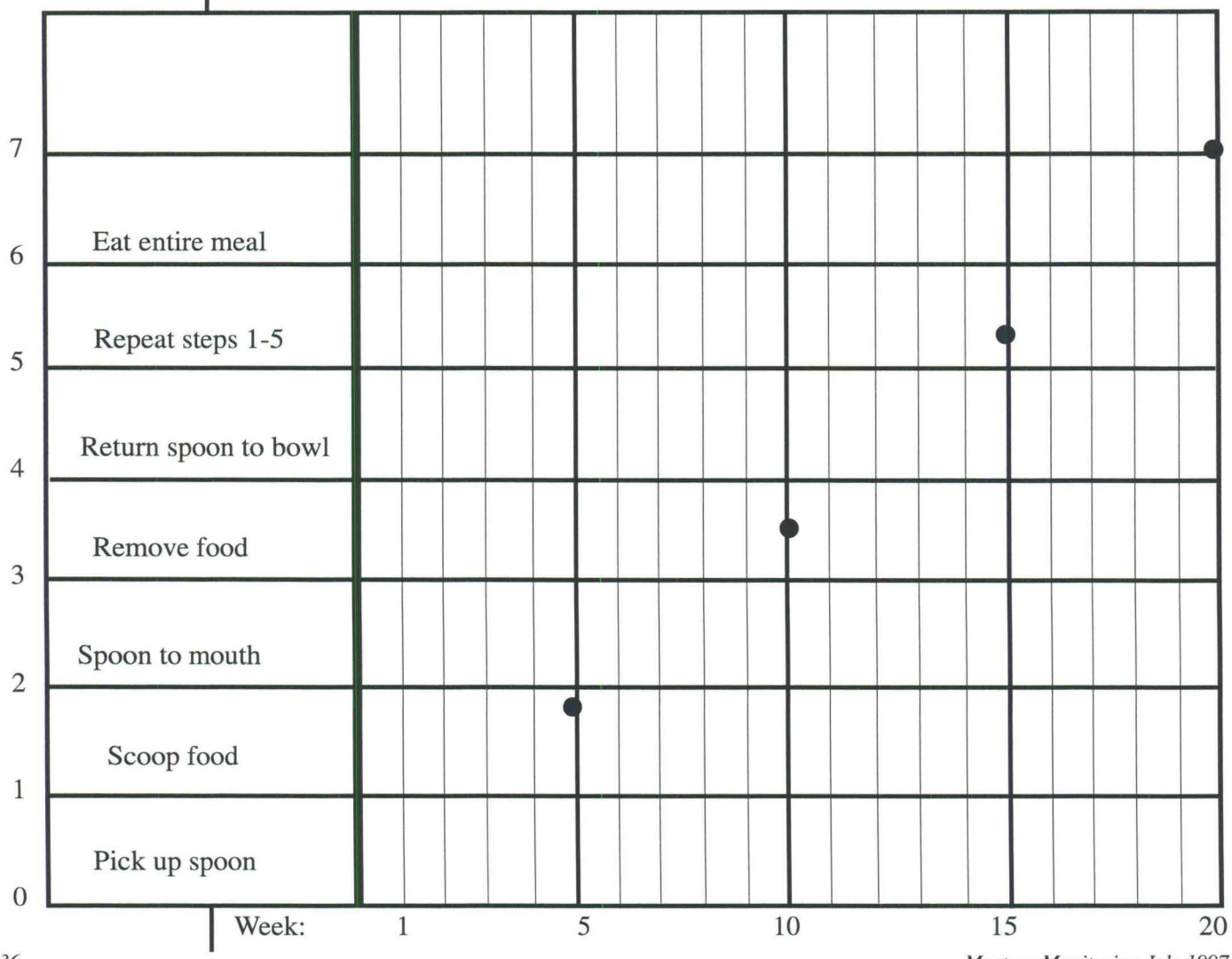
Obj. 2 = 3.5

Obj. 3 = 5.25

Goal Criterion = 7.0

Step 3 - Plot Quarter Stars

Plot the quarter stars at the intersection of the weekly interval and the subskill points.



Charting

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7. Write data recording system (Key)

Two types of data are recorded: **Quantitative and Qualitative**

A. Quantitative Data

Mastery of subskills (pass/fail)= progress toward the goal

Example of establishing a *KEY:*

■ or + = Skill meets criterion

□ or - = Skill not attempted or performed

B. Qualitative Data

1. Error Data

Steps to Collecting Error Data:

- Determine the type of error data to record
- Establish a key

Using spoon:

Key:

G= gestural cue
P = physical prompt
0 = skill not attempted
V = verbal prompt
R = report

Charting

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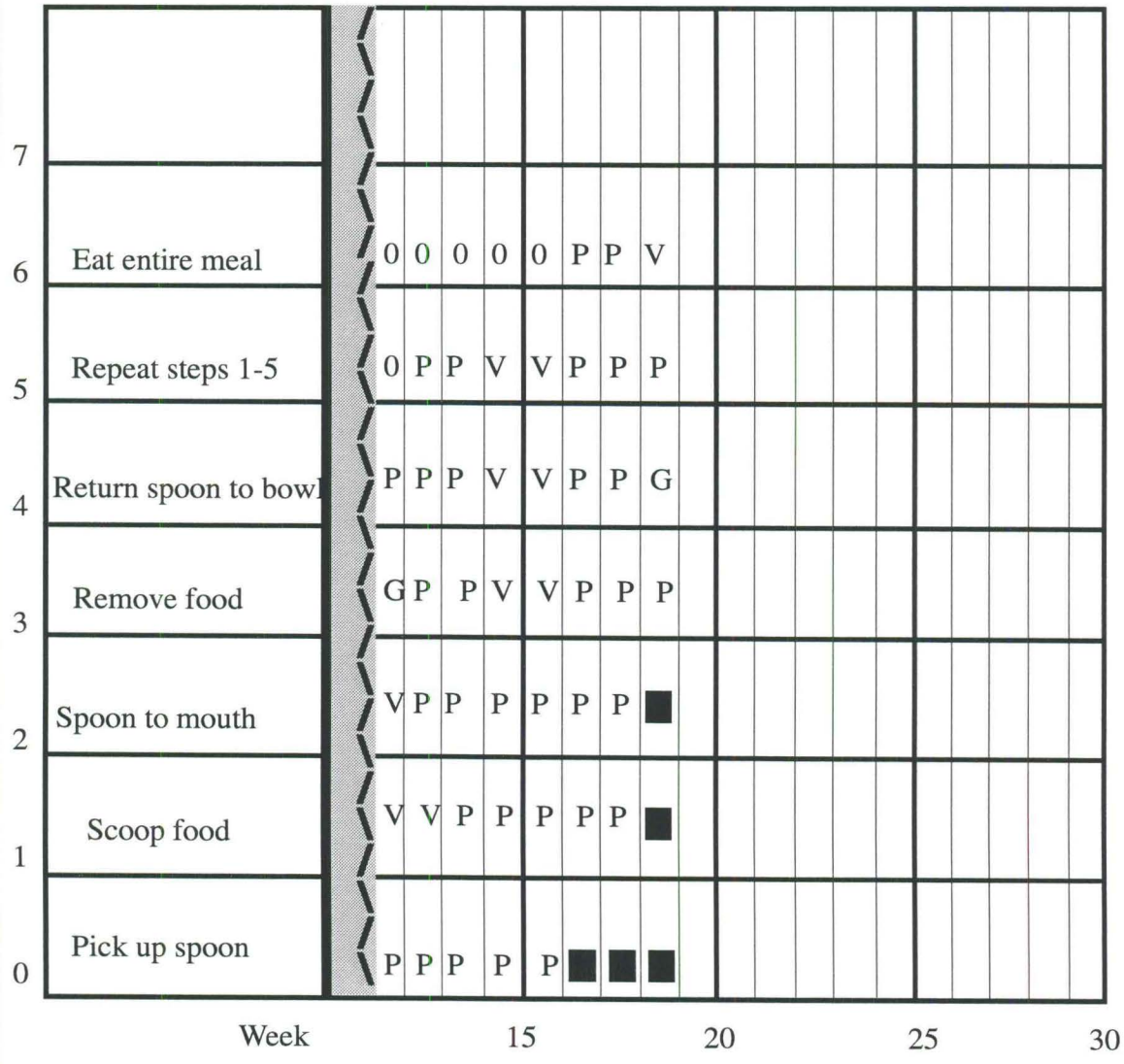
Example using a key:



Charting

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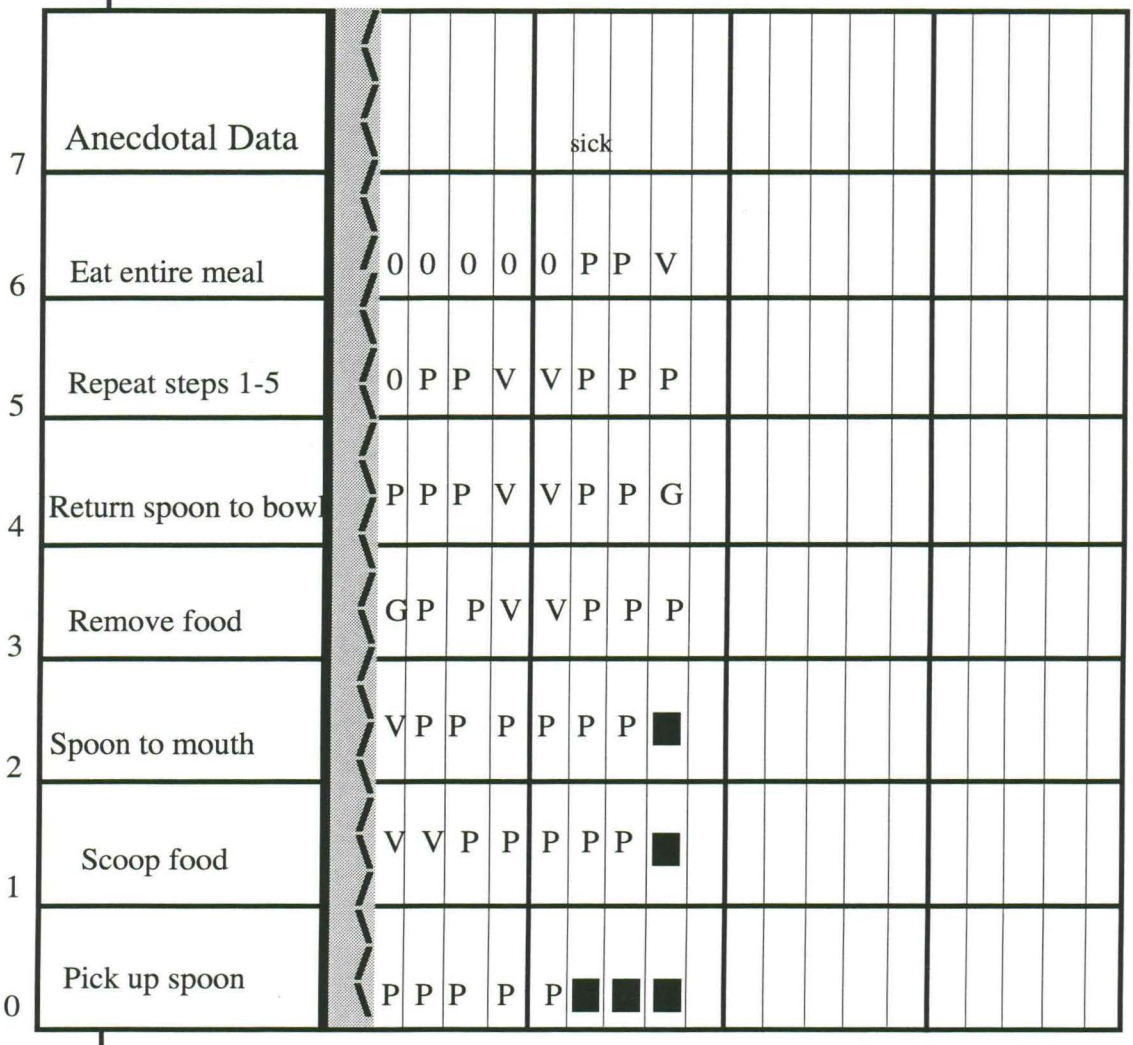
2. Anecdotal Data

Learning is often affected by events and conditions that are not part of the instructional program. Routinely record these items as you notice them to be better equipped to interpret the data. This improves communication among the instructional team. Record in a way that is most useful for the teacher (back of the chart, data collection boxes on the front of the chart, log sheet). Examples:

- missed sessions
- vacation
- medications
- illness
- any special circumstance that may have impact on learning both positively and negatively



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Decision Making

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Professional judgment is adherence to high standards based in research and informed practice that is established by professional organizations or agencies. Professionals formulate decisions utilizing these standards as a means of defining their practice. Professional judgements occur when a professional has particular expertise and applies standards unique to their training to solve problems germane to their practice.

Katz, 1994

Decision Making

Feel free to use this space for notes!

Professional Judgment requires:

- Defining and diagnosing problems
- Determine factors that influence performance
- Consider alternative solutions
- Estimate long range consequences of decisions
- Determine actions based on information gathered
- Determine actions using all available information to inform professional judgment

Types of Data Used in Decision Making

Quantitative

- Progress toward the goal measured by number of subskills mastered
- Analysis of data points

Qualitative

- Anecdotal and error data

Steps in decision making

Step 1 - Consider Quantitative Data

- Review Quarterly (quarter stars)
- Review data points

Step 2 - Consider Qualitative Data

- Review on a weekly basis or as instruction occurs
- Use at least 5 data points in your review

Decision Making

Feel free to use this space for notes!

Step 3 - Record decision making plan on Job #1 chart

Instructional Intervention Plan

Decision Making Plan:

Examine quantitative data on a quarterly basis
Examine qualitative data weekly
Base changes on data and professional judgment

Student_____ **Goal Area**_____

Intervention Instructional Planning

Phase	Instructional Procedures	Materials	Arrangements	Time	Motivational Strategies
1	Skills and Strategies				
2	Skills and Strategies				
3	Skills and Strategies				
4	Skills and Strategies				

Note Page

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Intervention and Data Collection

Feel free to use this space for notes!

INTERVENTION: Planned activities and/or modifications for the purpose of altering behavior to achieve the goal.

- planful
- naturally occurs in environment
- goal-directed

A. Steps to defining intervention

1. Identify specific instructional procedures
2. Identify materials
3. Identify arrangements (e.g. setting, personnel)
4. Identify time
5. Identify motivational strategies
6. Include other factors as needed

Intervention and Data Collection

Feel free to use this space for notes!

Instructional Intervention Plan

Decision Making Plan:

Examine quantitative data on a quarterly basis
Examine qualitative data weekly
Base changes on data and professional judgment

Student Jonah R. **Goal Area** Self help

Intervention Designer: ECSE Tchr/OT **Advisor:** A. Trainer

Phase	Instructional Procedures	Materials	Arrangements	Time	Motivational Strategies
1	Skills and Strategies Classroom/Home: Hand over hand for all steps. OT-observe and offer new	• food • bowl • modified spoon	1:1 for all meals at home and school	15 min.	food, praise
	strategies for programs; continue other act. to develop hand skills				
2	Skills and Strategies Parent will try harder to have Jonah at school every day.	same	same	same	same (choc. pudding great motivator!)
3	Skills and Strategies				

Feel free to use this space for notes!

B. Data Points

Summarizes mastery of subskills at a given point in time.

Determining data points:

Step 1: Using established key, record data on individual subskills

Step 2: Count number of subskills mastered

Step 3: Find the number on the left hand side of the chart that corresponds with your total from step 2.

Step 4: Follow that line over to the corresponding day

Step 5: Place a dot where these intersect (date/number line)

Consecutive data points are often connected:

However, DO NOT connect data points

- Across phase/change lines
- Across student absences or school vacations

C. Phase/Change Lines

- Reflect team decisions in the instructional intervention plan
- Use solid vertical lines extended above goal line to indicate major changes in the program such as:
  - Change in intervention
    - personnel
    - strategies
    - amount of time
    - equipment
  - Change in subskill
  - Change in criteria