SAFMEDS:
A Tool to Build Fluency

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Contents

Introduction	This page shows the layout and contents of the document. Certain criteria exist for: • development of SAFMEDS decks • production of SAFMEDS decks • use of SAFMEDS in a way that promotes fluency

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Page Numbering	Each Section begins with an overview as page 1. The section label is followed by the page number within the section. Examples: Develop-3 — Third page of section on developing SAFMEDS. Use-4 — Fourth page of section on using SAFMEDS.
Information Mapping®	Information Mapping® refers to an integrated set of principles, techniques and standards. It enables authors to break complex information into its most basic elements and then present those elements optimally for readers. Standard type face fonts and much white space speed reading. This results in a set of precisely defined information modules consistent from author to author and document to document. The authors infomapped this material to comfort you while accelerating your reading and learning. For more info, contact 800-INFOMAP (800-463-6627) or www.infomap.com.
Note: Hir as pronoun	The document uses "hir" as the possessive pronoun, combining the masculine "hi" from "his", the feminine "h-r" from "her", and retaining the pronunciation of the feminine form.

Background

Overview

Introduction

SAFMEDS serve as a learning tool to help:
• Teachers provide students with basic facts in a content area
• Students learn subject matter to fluent levels of performance
• Learners create their own materials on special areas of interest
SAFMEDS consist of cards with a fill-in-the blank statement on the front and a brief answer on the back. In working with SAFMEDS, learners see the front and say the back as they are timed for brief durations.

Advantages to student or learner

An individual attempting to learn information with SAFMEDS:
• Knows specifically **what** information needs to be learned
• Knows just **how well** the information needs to be learned
• Can sample hir own behavior at any time to see how closely one matches performance aims
• Avoids guesswork or ambiguity such as when someone says: "You're responsible for everything assigned in the text and everything we go over in class."

Advantages to teacher or trainer

An individual teaching or training others with SAFMEDS can:

• Specify what information needs to be learned
• Control performance standards of how well the info needs to be learned
• Sample a learner's behavior in as little as 20 seconds to see how well the learner's behavior matches the performance standards
• Easily monitor performance of all learners on a daily basis
• Monitor learning pictures of all learners with Standard Celeration Charts

In this section

Fluency

Introduction

The development of the concept of fluency and its importance throughout areas of learning has occurred over the past fifty years. Initial work by B.F. Skinner, Og Lindsley, Clay Starlin and Eric Haughton has led to applications in education and training. Carl Binder, sometimes known as "Dr. Fluency," has a Web site (www.Fluency.org) where one can view relevant historical papers. His 1993 paper, "Behavioral Fluency: A New Paradigm," represents one example.

Definition: fluency

Fluent behavior consists of actions done smoothly, without hesitation. Fluent behaviors exhibit high frequency and high accuracy. The precise speed and accuracy depend upon the particular responses involved.

Frequency

B. F. Skinner championed the use of rate or frequency as a universal response measure. Since any behavior has frequency, it serves as a behavioral compare-all. Free operant behavior studies, in which organisms operate freely in simple environments, demonstrated the power of monitoring frequency beginning with the studies published in Skinner's **The Behavior of Organisms** (1938).

Celeration

Ogden Lindsley extended Skinner's work from the animal laboratory to human behavior in institutional settings. Lindsley saw that frequency over time would yield "celeration"—the root word for acceleration. He realized that the difficult distinction between performance and learning could be clarified. Frequency was equivalent to performance and celeration was equivalent to learning. Celeration reflected growth and decay and like frequency could be applied to virtually everything.

Standard Celeration Charts

Lindsley developed a Standard Celeration Chart that would allow quick and easy projections of behavior and comparisons of trends. This chart has become a flexible tool for the visual interpretation of change and its use has generated a number of important specific and general discoveries.

High Frequency

Clay Starlin first advanced the idea that setting aims at high frequencies would squeeze out errors. Starlin designed entire curricula with high frequency aims. Eric Haughton, one of Lindsley's students and Starlin's graduate advisor, extended the advocacy of high frequencies for all sorts of behaviors (Lindsley, 1996). Haughton and Harold Kunzelmann also introduced one-minute timings as a way to monitor such frequencies daily.

SAFMEDS origin

In 1978, Ogden Lindsley told us over the phone about using "flashcards". He soon realized that the name needed to tell you more precisely what to do. He coined the term "SAFMEDS" in an effort to communicate correct use. The term "SAFMEDS" provides an acronym for "Say All Fast Minute Every Day Shuffled." Within several years we were using them within our classes..

Og Lindsley's Acronyms on Fluency:

PRACTICED MUSIC REAPS FUN CGS

Inroduction	Eric Haughton created the acronym "REAPS" to summarize the benefits of high frequency, or fluent behavior. Og Lindsley extended the acronym to 25 results as findings accumulated. Without going into detail, here are those findings.
Practice should be:	• Particular - same environment and task conditions • Rapid - performance without hesitation • Added - to enhance not replace instruction • Counted - preferably by learner • Timed - preferably by learner • Informed - preferably by learner (feedback) • Charted - preferably by learner on Standard Celeration Chart • Errorful - with learned guessing if uncertain • Daily - with hits-misses-floors and total timings charted
Learning seems to be:	• Multiply - frequencies grow, decay, bounce & spread by * (not +) • Unique - to each learner (instead of common to all) • Specific - to environments (instead of general to all environments) • Independent - of other learning (instead of dependent on other learning) • Consequence - controlling behavior (instead of antecedent control)
Fluency leads to:	• Retention - of skills and knowledge • Endurance - of attention and performance • Application - to next learning • Performance Aims - speed and accuracy standards • Stability - resistance to distraction
Timing outcomes promote:	• Fun - fluent performance enjoyable • Understanding - teach what learners request • No cheating - when one-on-one
Side effects of fluency:	• Confidence - in own performance capability • Generativity - leaps in composites not specifically practiced • Stress inoculation - small doses help meet later challenges

Rationale for Fluency in Education

Introduction

How can education be improved? One way to explore this question involves asking four questions:
• What goes on in a typical class?
• What's wrong with that picture?
• What better alternatives exist?
• What makes the alternatives better choices?

Typical class

In a typical class:
• The teacher assigns content and talks content
• The students read content take notes
• An objective quiz, test, or exam is scheduled periodically
• The students cram before quiz, test or exam from notes and text
• Feedback is given on test performance
• The sequence begins again with new content

What's wrong

Without attempting to pinpoint all the ways in which a typical class can go wrong, the following items provide an initial focus.
• Information overload if importance involves "everything"
• Cramming behavior rewarded
• Retention minimal
• Remediation usually ignored
• Fluency not achieved

What's better

The basis for an improved model involve:
• Specifying information to learn
• Retooling student behavior to daily practice
• Rehearsing needed learning repetitively
• Continuing remediation of slow or wrong responses
• Achieving fluency—smooth, automatic proficiency on essential information

Why

The alternatives provide better choices for the following reasons:

Why wrong	Why better
Learning should not be a guessing game nor should a student's information repertoire be a hodge podge of unrelated bits and pieces.	Specifying what information needs to be learned takes the guesswork away and can provide an appropriate structure for later learning.
Cramming leads to a way of life that may never be broken.	Daily practice characterizes behavior of effective individuals.
Answering a question correctly once carries no guarantees for retention or transfer to other learning situations	Timed repetitive practice on key elements does produce retention and transfer.
Missing items carries no sense of the need to pick up the information that was lacking.	Policy of remediating wrong or slow answers establishes fluency-building philosophy.

Features of SAFMEDS vs. Flashcards

Introduction SAFMEDS represent an approach to learning that departs from the traditional techniques that emphasize accurate performance. Such techniques either pay no attention to **speed** of the performance or specifically downplay its significance. SAFMEDS, by contrast, emphasize fluent performance—speed and accuracy. The term "SAFMEDS" provides an acronym for "Say All Fast Minute Every Day Shuffled".

Flashcards Typical flashcards or study cards help separate independent chunks of information. Serial-learning effects that characterize learning of lists or page orders in a textbook can be avoided.

SAFMEDS-Flashcards Compared SAFMEDS and "flashcards" or "study cards" tend to have the following general or specific features:

Feature	SAFMEDS	Flashcards
Generated by	teacher	learner or teacher
Entire set	available from day one	all or partially available
Response	**Say** out loud	Think to self or say
Work on	**all** cards from day one	only cards covered
Front of card	seen, not said	read, not said
Back of card	short, easy to say	much detail, hard to say
Pace	timed, **speed vital**	leisurely, untimed
Strategy	Say answer without looking at answer	Read without anticipating answer
One performance	**minute** or less	not timed or kept
Emphasis	speed & accuracy	accuracy only
How often?	**every day**	sporadic or night before
Order	**shuffled**	stacked or shuffled
Tested by	20-second timing	Transfer to other task such as multiple choice

Basic Math Fact Flashcards These represent the closest historical approximation to SAFMEDS. They featured:
- Basic add, subtract, multiply or divide fact on front, answer on back
- Emphasis on speed as well as accuracy, although the speed aims tended to be low or conservative by SAFMEDS standards
- Commericial availability, although some publishers put a fact on both sides with answer to reverse side in small font at corner

Characterisitics of SAFMEDS

Structure: SAFMEDS	SAFMEDS represent decks of cards printed front and back. • The front contains information with a long dash to indicate something missing. • That missing word or phrase constitutes the back of the card. • Usually the back will also have some type of distinctive feature —such as a double line—which signals it as a "back" rather than a "front." • Extra information in parentheses on back can identify source and page.
Exception: Equations	In math and science applications of SAFMEDS involving equations, we found that the long dash tended to be confusing to the learner. In such decks, we suggest replacing the long dash with three question marks (???). This makes it easier for the student to discriminate the missing part of the equation.
SAFMED Example	The example below shows the front and back of a single SAFMED. • the long dash (5 underline characters) identifies the part on the left as a front • the double line near the left side identifies the part on the right as a back

Fact: Normal people think with streams of _____	words (Animals in Translation, Temple Grandin, Scribner, 2005, p10)

Note	Features providing extra information do not represent "crucial" characteristics. Examples of non-crucial (optional) characteristics: • "Fact" on front of card shows type of classification for this particular information • "Animals in Translation, Temple Grandin, Scribner, 2005, p10" shows the reference for the information (title, author, publisher, publication date, page number) should the learner want the source or further understanding of the fact.

Og Lindsley's Learning Streams and Channels

Background	Og Lindsley's term, "Learning Stream"(Lindsley, 2002a) precisely describes a learner's actions in a practice timing. It describes only the learner, focusing the teaching on the learner. It does not describe teacher behavior or nonessential curriculum features. Learning Stream classification can prove useful since learning tends to be specific to settings rather than general to all settings. Here Learning Streams are applied to SAFMEDS.
Definitions:	A Learning Stream consists of one or more Channels or Stages. A Learning Stream <u>Stage</u> consists of a verb, its object and object modifier. Example: **See** (verb) **SAFMED** (object) **front** (object modifier). A Learning Stream <u>Channel</u> consists of a sequence of Stages.
Distinctions: Stages and Channels	Learning Stream with 2 Stages and 1 Channel: • See SAFMED front then Say SAFMED back Note "then" describes a sequence rather than simultaneous behavior. Behaviors in sequence define separate Stages but not separate Channels. Learning Stream with 3 Stages and 2 Channels: • Slide SAFMED card off deck as See SAFMED front then Say SAFMED back Note "as" describes simultaneous behavior. Behaviors done simultaneously define separate Channels and Stages. Any verb involves a Stage whether it be simultaneous or sequential. Separate Channels occur with simultaneous behaviors.
Nonfluent SAFMEDS Example	6 stage 1 channel stream • Verbs **Slide-See-Say-Flip-See-Place** • Sentence **Slide next card off deck then See front then Say back then Flip card then See back then Place in correct, incorrect or slow stack.** Note that each verb occurs sequentially, so this example involves one Channel with six stages. This would be typical of initial SAFMED learning phases where speed tends to be low—under 20 cards per minute. Note also that hyphens translate as "then."
Fluent SAFMEDS Example	4 stage 3 channel stream • Verbs **Slide-SeeSayPlace** • Sentence **Slide next card off deck then See front as Say back as Place in stack.** In the fluent phase of SAFMEDS, seeing the front, saying the back and placing the card occur virtually at once, producing high speeds of over 60 per minute or better with high accuracy. Considerable practice is usually needed to produce this behavior. Verbs without spaces or hyphens translate to "as," meaning they occur at the same time.

Developing SAFMEDS

Overview

Introduction   Developing SAFMEDS involves deciding on content area, locating appropriate information, and transferring the information to an appropriate form from a source onto a template representing the front and back of SAFMEDS cards.

In this section   In this section we'll inspect some of the various types of information that can constitute the front or back of a card, look at some examples of such types, look at some nonexamples, and go over guidelines for development. Finally we'll sample some specific topic areas to show the process of SAFMEDS development.

A SAFMEDS Classification System

Table of possibilities   The following table shows many of the possibilities for generating SAFMEDS that conform to the guidelines that will be described later. The list should not be construed as exhaustive of all possibilities.

SAFMEDS Type	What you see	What you say
Fact: who said it	quotation	person who said it
Fact: contribution	contribution(s)	person credited
Fact: quote	name (and topic)(part of quote)	quotation (or part of quote)
Fact: say acronym	words replaced	acronym
Fact: acronym	acronym	word(s) replaced
Fact: completion	starts fact	finishes fact
Process: label	describes process	names process
Process: definition	names process	describes process
Procedure: label	describes procedure	names procedure
Procedure: definition	names procedure	describes procedure
Concept: label	describes concept	names concept
Concept: definition	names concept	describes concept
Concept: feature	names concept & feature	names missing feature
Concept: identify	provides example	names concept
Concept: not	provides nonexample	names 'not' concept
Concept: generate example	names concept: Example?	provides example
Concept: generate nonexample	names concept: Nonexample?	provides nonexample
Principle:label	describes principle	names principle
Principle: definition	names principle	describes principle
Classification: label	describes classification	names classification
Classification: definition	names classification	describes classification
Structure: label	describes structure	names structure
Structure: definition	names structure	describes structure
Structure: identify	shows structure	names structure

Examples of SAFMEDS from Classification Table

SAFMEDS Type	What you see	What you say (bold font)
Fact: who said it	quotation **"Behavior grows by multiplying":** _____	person who said it (Ogden) **Lindsley**
Fact: contribution	contribution(s) **Developed SAFMEDS and Standard Celeration Chart:** _____	person credited (Ogden) **Lindsley**
Fact: quote	name (and topic) **Ogden Lindsley: "Behavior grows by** _____ **"**	quotation **star slash** (multiplying)
Fact: say acronym	words replaced **Say All Fast Minute Every Day Shuffled:** _____	acronym **SAFMEDS**
Fact: acronym	acronym **Reasons to emphasize fluency: REAP$_S$:** _____	word(s) replaced **performance aims**
Fact: completion	starts fact **Reinforce?** _____	finishes fact **Behavior not people**
Process: label	describes process **Sudden but reliable celeration change:** _____	names process **Jump** (Up or Down)
Process: definition	names process **Analysis:** _____	describes process **finds links**
Procedure: label	describes procedure **Invent explanation which itself becomes a fictitious thing:** _____	names procedure **reification**
Procedure: definition	names procedure **Click and Treat:** _____	describes procedure **trains act**
Concept: label	describes concept **Correct and error celerations combined produce a:** _____	names concept **learning pic** (learning picture)
Concept: definition	names concept **Learning picture:** _____	describes concept **cel combos** (correct and error celeration combinations)
Concept: feature	names concept & feature **Learned results lose power if never:** _____	names missing feature **paired**

Guidelines for Developing SAFMEDS

Primary rule

The first rule should not be violated.

Primary Rule	Elaboration	Reason
• Keep answers short	Abbreviate if necessary	Short answers permit high speed. You don't want to produce what Carl Binder has called "Fluency Blockers™."

Other rules

The other rules represent guidelines which usually should be followed in developing SAFMEDS.

Rule	Elaboration	Reason
• Make blanks the same	5 underline characters cue the answer, regardless of answer length or words in answer	You don't want the pattern of blanks to serve as the stimulus for the response instead of the words
• Put blank at end	Blanks could occur anywhere; try to have them at end or nearly so	All cards similar in this respect makes task easier to learn
• Emphasize differences	Emphasize crucial differences in similar concepts with boldface, underlining, or italicizing	You want to help the learner focus on the critical feature that distinguishes similar concepts
• Keep fronts simple	Explanatory info can be placed in parentheses in smaller font size on back of card under answer	The see/say parts of the card should be a "hook" for info, not the whole closet
• Omit key words	If you want learners to be able to say a definition, construct multiple cards with a different key word left out on each	One card won't produce recall of entire definition but 4 or 5 cards will

Size of Deck

Deck sizes can differ, but generally run between 80-150 total cards per deck.
        If the content area contains fewer items:
        • can combine with other content areas within same course or training
    • can duplicate key cards or all cards to provide enough that learner doesn't   finish all in less than a minute
        • could consider other fluency alternatives such as practice sheets

Guidelines for Developing Math and Science Equation SAFMEDS

Primary rule

The first rule should not be violated.

Primary Rule	Elaboration	Reason
• Keep answers short	Abbreviate if necessary	Short answers permit high speed. "

Other rules

The other rules represent guidelines which usually should be followed in developing math and science equation SAFMEDS.

Rule	Elaboration	Reason
• Use question marks instead of blanks	Question marks cue the answer,in equations	Blanks in equations tend to be confused with quotient lines
• Always use 3 question marks for answer: ???	3 question marks cue the answer, regardless of answer length or words in answer	You don't want a pattern of question marks to serve as the stimulus for the response instead of the words
• Put ??? at end	??? could occur anywhere; try to have them at right side of equation if possible	All cards similar in this respect makes task easier to learn
• Keep fronts simple	Explanatory info can be placed in parentheses in smaller font size on back of card under answer	The see/say parts of the card should be a "hook" for info, not the whole closet
• Omit key elements	If you want learners to be able to recall an equation, construct multiple cards with a different key element left out on each	One card won't produce recall of entire equation but 4 or 5 cards will

Developing Your SAFMEDS Materials

Your Aim   Assuming you desire to develop at least one set of SAFMEDS for a content area which you teach or train, jot down some possibilities.
• What content area would you set at highest priority?

• What other content areas—if any—seem feasible to you for SAFMEDS development?

Narrowing the aim   Within a broad content area you mention above, what specific topics can you recall that learners:
• often confuse
• seldom remember
• soon forget
• can't see how parts relate
Jot down any you can recall for future reference. Try to be aware of such problems when they occur in the future.

Working from materials   Using whatever source for your SAFMEDS you have identified:
• go through and highlight the crucial information you want learners to know
These next steps will be easier after you've completed this document:
• go back and try creating SAFMEDS from your highlights
• create them on a worksheet with two columns—for fronts and backs
• don't fret about making them perfect—just get started
• you can revise them whe you type them into the software

Using the software   In the section, "Producing SAFMEDS," we'll introduce you to the templates for producing your decks. Using these templates you will be able to enter fronts and backs directly into the software so that your SAFMEDS decks can be created easily.

Problems and Solutions

Overview

Introduction   Developing SAFMEDS appropriately following the guidelines will take some practice. We hope to aid your learning by providing examples of less than optimal SAFMEDS and how they might be improved.

In this section   In this section we'll inspect examples of some of the problems that occur as one attempts to develop a SAFMEDS deck.

Answer Too Long

**Problem:
Answer too
long**

Increease act by removal of
aversive immediately following act: _____

Front of card above; Back of card below.

Reinforcement by the removal
of an aversive condition

The answer contains too many words. Look for short answers.

Improved

Increease act by removal of
aversive immediately following act: _____

Front of card above; Back of card below.

Relief
(Reinforcement by the removal
of an aversive condition)

The answer now contains one word with two syllables.
More extensive answer can be put in parentheses.

Blanks of Different Lengths

**Problem:
Blanks of
different lengths**

Thomas Malthus quote:
"There will _____ __ _____"

Front of card above; Back of card below.

never be enough
(to go around, given multiplying
populations and resources growing
by adding)

Blanks of different lengths give clues which can control
responding.
You don't want learners relying on such cues.

Improved

Thomas Malthus quote:
"There will _____"

Front of card above; Back of card below.

never be enough
(to go around, given multiplying
populations and resources growing
by adding)

One blank of five spaces serves as standard for answer.

Blank Positioning

Problem: Blank positioned at front

_____: "Behavior is a function of
its consequences."

Front of card above; Back of card below.

Skinner
(B. F. Skinner)

Blanks in different positions give clues which can control or
slow responding.
You don't want learners relying on or being slowed by such
cues.

Improved

"Behavior is a function of
its consequences:" _____

Front of card above; Back of card below.

Skinner
(B. F. Skinner)

Blank of five spaces at end serves as standard for answer.

Front Too Long

Problem: Front too long

Events of procedures which influence the body's sensitivity to reinforcers and aversive conditions avoid reifications such as a vague reference to "motivation:" _____

Front of card above; Back of card below.

E O
(establishing operation)

Too much info on the front slows the learner.
If several cards like this, they will likely be skipped during timing.

Improved

Event that affects bodily conditions: _____

Front of card above; Back of card below.

E O
(establishing operation)

Sufficient but brief cue allows quick response.

Blank By Itself

Any behavior has a frequency which equals
_____

Front of card above; Back of card below.

count over time

A blank by itself can slow a learner.

Improved

Any behavior has a frequency
which equals: _____

Front of card above; Back of card below.

count over time

Avoiding blank alone serves as standard for answer.

Similar Concepts

**Problem:
Similar
concepts**

> Accelerates act when removed
> contingently: _____

Front of one card above; Front of another card below.

> Accelerates act when presented
> contingently: _____

Similar concepts confuse and slow learner.

Improved

> Accelerates act when **removed**
> contingently: _____

Front of one card above; Front of another card below.

> Accelerates act when **presented**
> contingently: _____

Underlining and bold fonts highlight critical differences
Learner can focus on these features rapidly.

One Card, Many Elements

One card with one word left out

> Love: the gift of behaving
> to enhance: _____

Front of card above; Back of card below.

> life

Learner not likely to learn entire definition, when want entire definition known.

Improved

> Love: the gift of behaving
> to enhance: _____

> Love: the gift of behaving
> to _____ life.

> Love: the gift of _____
> to enhance life.

> The gift of behaving
> to enhance life: _____

Fronts of different cards above with size modified. Learner will be able to say entire definition.
This situation provides exception to rule demanding blank occur only at end.

Producing SAFMEDS

Overview

Introduction Producing SAFMEDS involves entering the fronts and backs of cards you've developed onto software templates provided. After printing an original set on an available printer, one can take the sheets to a copying center or your curriculum resource center to have double-sided card stock copies run.

Computer Advantages While one can produce SAFMEDS by hand, use of the computer allows for:
- Easiest readability
- Quickest production (if using template)
- Publication-quality materials
- Easy storage and retrieval via disk
- Easy editing for updates
- Easy virtual cut-and-paste for cards common to different decks

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SAFMEDS Templates A SAFMEDS template consists of pages formatted and coordinated to provide outlines for cards on the page. The templates set up generate 12 cards to a page. You'll enter the front and back information on one sheet of a Microsoft Excel® spreadsheet. We have set up this software to format the fronts of the sheets and the backs of the sheets so they can be printed. Once printed on card stock sheets, the individual cards can be cut and stacked to form a deck.

Platforms You will find SAFMEDS templates on the CD that comes with this document—some for Mac users and some for Windows, both using Microsoft Excel®.

Challenges The biggest challenge will be to locate a template that prints appropriately—12 cards to a page—on your model printer. This challenge occurs because printers differ and don't produce a standard output. We'll provide tips on how to best cope with this challenge.

In this section In this section we'll describe how to use the templates, and we'll suggest a few directions for working with the people who produce your cardstock copies.

Using Microsoft Excel®

Using Excel®	The templates for SAFMEDS have been set up in Microsoft Excel®. When you open the Microsoft Excel® Templates, note the tabs displayed at the bottom of the screen. These describe what's on the different spreadsheets. • <u>Instructions</u>: provde details on how to operate • <u>Front back entry sheet</u>: where you enter your fronts and backs • <u>Front Sheet 1</u>: what the front of printed sheet one will look like • <u>Back Sheet 1</u>: what the back of printed sheet one will look like • <u>Fronts and Backs</u> alternate through Sheet 13

Definition: Sheet	The term "sheet" refers to two different things:
	
	• a sheet in Microsoft Excel® which involves a <u>spreadsheet</u> with rows and columns that combine to form cells. Each SAFMEDS Template consists of an Excel file made up of 28 spreadsheets.
	  • the first spreadsheet contains instructions
	  • the next spreadsheet handles the fronts and backs of all your SAFMEDS for a particular deck
	  • the final 26 spreadsheets format the SAFMEDS you've entered into a form that you can print and eventually cut into SAFMEDS cards, 13 fronts and 13 backs
	• a <u>printed sheet of SAFMEDS</u> which refers to the product once you've printed the front and back of any or all of the 13 fronts and backs of the Excel sheets

Instructions	The instructions on how to use the SAFMEDS Templates to produce SAFMEDS exist both in this document and on the templates themselves for your convenience.
Entry Sheet	The Front Back Entry Sheet allows easy set-up for most decks, because you can type the front and the back of the card and see them displayed together. Important note: You <u>don't print</u> the Front Back Entry Sheet. The information on this sheet gets picked up by other sheets which are formatted for printing the SAFMEDS.
Fronts and Backs	There exist 13 separate fronts and 13 separate backs which will automatically read the information you've typed on the single Front Back Entry Sheet and format it appropriately. These are the sheets that you will ultimately print.
Printing a Master	You may desire to print a Master copy on regular paper from which the card stock SAFMEDS for each member of your classes can be duplicated. We recommend this procedure because printing Fronts and Backs on card stock directly from Excel tends to be tricky and time consuming, and can result in spoilage of card stock sheets. The easiest way to proceed involves selecting and printing all Fronts and Backs on separate sheets, then having a copy machine produce the card stock SAFMEDS double sided.

Identify a Template for your Platform, System, & Printer

Which Folder to Use

This table shows which folder on the SAFMEDS CD contains which SAFMEDS template. Try to find a match based on your computer, operating system, and printer. An additional page of possibilities follows.

use the template in this folder	computer	operating system	printer
 Mac HP Deskjet 5740 SAFMEDS template	Macintosh	OS 10	Hewlett Packard Deskjet 5740
 PC HP Laserjet 6L SAFMEDS folder	PC	Windows 95	Hewlett Packard Laserjet 6L
 PC HP Deskjet 812C SAFMEDS folder	PC	Windows 95	Hewlett Packard Deskjet 812C
 PC HP Deskjet 812C SAFMEDS folder	PC	Windows XP	Hewlett Packard Deskjet 3650

Identify a Template for your Platform, System and Printer, continued

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Which Folder to Try

If your "computer/operating system/printer" arrangement does not appear in the previous table, try the closest match from below:

use the template in this folder	computer	operating system	printer
Mac HP Deskjet 5740 SAFMEDS template	Macintosh	any Macintosh OS	any Hewlett Packard Deskjet
Mac HP Deskjet 5740 SAFMEDS template	Macintosh	any Macintosh OS	Any Hewlett Packard LaserjetL
PC HP Deskjet 812C SAFMEDS folder	PC	any version of Windows	any Hewlett Packard Deskjet
PC HP Laserjet 6L SAFMEDS folder	PC	any version of Windows	Any Hewlett Packard Laserjet 6L
Mac HP Deskjet 5740 SAFMEDS template	Macintosh	any Macintosh OS	any other printer
PC HP Deskjet 812C SAFMEDS folder	PC	any version of Windows	any other printer

General Template Instructions

Disk Contents	The Compact Disk(s) contain(s) several SAFMEDS Templates done in different versions of Microsoft Excel® on both Windows and Macintosh operating systems. You should try the closest match to your system. A folder identifies the particular system. Open a folder to access the SAFMEDS Template file.

Drag File

Once you have identified the closest match, drag that file from the Compact Disk icon to your hard drive, flash drive, floppy disk or other medium. This will produce a copy of that file that will serve as your master for SAFMEDS production.

Rename File

For each deck or set of SAFMEDS (up to 156 cards) that you create, you should begin each set by using the SAVE AS command under the FILE menu. When asked to name the new file, generate a unique name for this particular deck. Highlight the generic name, then type the name you want. To be consistent, we suggest a format such as "<subject> SAFMEDS by <your name>." This name will appear at the top left of each printed sheet.

Examples:
• Tracking SAFMEDS by Tom Brown
• Algebra I SAFMEDS by Jack Auman
• Remote Viewing SAFMEDS by Steve Graf
• Learning Picture SAFMEDS by Og Lindsley

Enter Fronts and Backs

Note the tabs at the bottom of the template—"Instructions," "Front back entry sheet," "Front Sheet 1," "Back Sheet 1," "Front Sheet 2," etc. Click on the "Front back entry sheet."

Next, click on "front 1." This puts the cursor in position for you to type in the front of card 1 that you've developed.

After completing front 1, tab to or click on "back 1." This places the cursor in position to enter the back of card 1 that you've developed.

Continue in this fashion entering the fronts and backs for the cards that will make up your deck. Note that you're entering all the fronts and backs on this "Front back entry spreadsheet."

Ready to Print SAFMEDS sheets

After completing the entry of all fronts and backs, you're ready to print your master. Remember, there are 12 cards to a printed sheet, so to determine how many sheets you'll need to print, divide the total number of fronts by 12. You'll need to print both the front and back of each of those sheets. You'll also see the sheet number and card number in blue and yellow shaded areas at the borders of the Front back entry sheet.

Printing Tips

Use Print Preview	Because of differences in the way different printers handle margins, obtaining your SAFMEDS master copy may require some patience. Each page should print 12 cards, either fronts or backs. You can check to see that this is going to happen by first clicking on the tab "Front Sheet 1" at the bottom of the Excel Template and then running Print Preview under the File Menu. If the page shown has 12 cards, close the Print Preview and repeat the procedure for "Back Sheet 1" and the rest of the sheets being used.
Try Page Setup if Problem	If you find a page or pages where fewer than 12 cards appear under Print Preview, open Page Setup under the File menu. In the Scaling section, click on the down arrow to the left of "% normal size" to change from 100% to 95%. This will slightly decrease all of the sheet sizes that you're trying to print. After making this adjustment, return to Print Preview to verify that 12 cards will now print from each page.
Don't Print Front Back Entry Sheet	Remember, the Front back entry sheet does <u>not get printed</u>. This sheet is not formatted for proper card size. It functions as an easy way to input the SAFMEDS content because you enter information for both the front and back of your cards in consecutive columns, rather than on separate sheets.
Select SAFMEDS Sheets to print	Print your SAFMEDS Sheets by first clicking the tabs (showing at the bottom of the Excel Template) of the sheets you want to print. Clicking on "Front Sheet 1" selects that sheet for printing. Do the same for the rest of the Sheets you want to print by holding down the **open apple key (on Macintosh machines)** and selecting the other sheets.
Print SAFMEDS sheets	Select Print from the File menu. • Be sure the correct printer has been selected • Be sure the "All" button is on (darkened) • Be sure the "Acive Sheets" button is on (darkened) Click on the "Print" button at the bottom.
Pages and Sheets not the same	In Microsoft Excel®, a sheet may contain a number of pages. A page does not necessarily equate to a sheet, so selecting all pages doesn't mean you will get all sheets printed. Don't choose: "Print the entire workbook." This will print the instructions, a number of pages of the Front back entry sheet showing sheet and card numbers and not formatted 12 to a page, as well as the Front and Backs of all 13 sheets but with nothing on them but the card number!

Working with the Printer and Distributing SAFMEDS

After Completing Your Template Master

Once you have typed and saved your material onto a SAFMEDS Template and printed a master copy, you can have them reproduced in quantity using a copier. If your copies are being done outside of your office facilities, you may want to shop around for the best prices. Be sure to provide the copy people careful instructions as to what you want.

Example of Instructions to Printer

Printing Instructions.
- Paper: Use card stock
- Pages should be printed double-sided.
- Be careful to align fronts and backs as perfectly as possible
- Collate

Binding Instructions.
- Do not bind or staple
- Use rubber band

Cutting Instructions (optional)
- Cut along lines shown on front of cards

Distribution

Once the card stock copies have been produced, the sets are ready to distribute to students. If your copy center does not include an industrial heavy duty paper cutter that can cut at least an entire deck at once, the pages should be left intact and each student can cut his or her own. It takes 20-30 minutes to cut up a deck of 120 cards.

Cost

If used in training, you may want to include the SAFMEDS cost in the cost of materials or the cost of training.

The following price estimates reflect 2004 quotes from Kinko's.
- 120 card deck (30 sets uncut) = $2.68 per deck
- 120 card deck (30 sets cut) = $3.10 per deck

Using SAFMEDS

Overview

Introduction   Using SAFMEDS involves:
- setting performance standards for your learners
- instructing them on appropriate ways to learn
- providing for daily practice
- working out the logistics of seeing everyone perform
- getting feedback for revising the next version

Comment on Feedback   Using a particular SAFMEDS set, expect:
- major changes in the first or second use
- minor changes thereafter

Learners will provide feedback in various ways, including complaints about difficult cards to learn.

In this section   In this section we'll provide some ideas on how you can successfully incorporate the use of SAFMEDS into your course or training.

General Rules and Tips for Learners

Primary Rule

The behaver should hold the deck for a timing.

Primary Rule	Elaboration	Reason
• Hold and turn own cards	Don't have counter hold card in front of learner	Almost twice as fast as when held by counter

Rules

General Rules for Use of SAFMEDS:

Rule	Elaboration	Reason
• Everyone use a standard deck	Keep one or two for "official" timings	Learners may "lose" difficult cards
• Allow no marks on card fronts	Marks promote control by irrelevant features	Marks block performance when they use your unmarked deck
• Turn card after saying back	See front, Say back, Turn card to see next	Allows counter to judge correct vs. incorrect; discourages "reading"; promotes "anticipating"
• Practice with other decks	When paired with a partner, use their deck for your timing	Promotes generalization to the slightly different "feel" of different decks

Tips for Learners

Other information that some learners will find useful:

Tip	Elaboration	Reason
Spend more and more of practice doing timings	Reading or "studying" may help accuracy, but fluency levels seem to result from practice timings	Practice fast to be fast
Say answers out loud during practice timings	Don't See front-Think answer; actually vocalize	Behavior seems very specific; SeeThink fluency doesn't automatically produce SeeSay fluency
Avoid checking accuracy of card after turn	Use See-Say-Slide mode after learner has become accurate on deck	Checking for accuracy slows one's speed
Practice your "slow" cards as a mini-deck, continuing until you can do 1 per second	Have someone watch you go through deck; have them pull out any on which you hesitate	This will bring toughest cards to fluent frequency

Tips for Teachers and Trainers

Content Tips   The following actions seem warranted from experience:

Tip	Elaboration	Reason
Urge learners to try "understanding" each card at some point	Understanding need not precede learning a SAFMEDS card	Fluent information has little value on its own
Urge learners to ask questions about content of cards they don't understand	Separate content questions from procedure questionsd	"Understanding" can help link the new to the unknown
Teach what learners request	Not necessary to go over all SAFMEDS	Many cards will be self-explanatory
Provide broad contexts	Help learners relate relatiionships to see patterns	Ties relevance into whole effort

Procedure Tips   The following actions will help maximize success:

Tip	Elaboration	Reason
Provide daily practice opportunities	Conduct two brief timings in class each day	Helps establish daily routine of practice
Have learners pair up each day with someone they haven't worked with before	After pairing with every other student, start over; don't allow constant partners	Avoids sloppy monitoring; avoids cliches; promotes socialization
Provide a Daily Timing Record Sheet	Learners monitor own performances daily outside class or training setting	Provides daily frequency aim to meet or exceed
Demonstrate "Go Runs" early in training	Time learners saying "go" to each card	• Promotes experience of high frequency • Helps pinpoint awkward card turning • Provides appropriate warmup prior to actual timing
Watch for learners reading fronts out loud	Correct learner to "see front" and "say back"	Reading front slows frequency
Count as "wrong" if learner turns card before saying answer	Learners should anticipate rather than read back	No cheating allowed

Providing Daily Practice Opportunities

Avoid inertia
Many learners lack appropriate self-discipline skills needed for SAFMEDS success. Providing supervised timings within a class session can be useful. Other penalties and incentives may need to be used if you find them necessary.

Use 5 min of class time
After gong through a timing session once explaining what to do at each step, learners quickly acclimate to what needs to occur and do it. We averaged (median) 3 or 4 minutes for the entire activity. 58 timings used 270 minutes (monitored across 3 classes for ten weeks), a mean of 4.6 minutes per day.

First two sessions lengthy
The first two times you use do the SAFMEDS timings in class, be prepared for the exercise to take about forty minutes. You will need to explain:
• why the counter's deck is used, not the behaver's
• how to shuffle the deck (and check to see all are right side up)
• how to hold the cards
• how to turn and place the cards
• how to set a landing platform
• why answers need to be said clearly
• how to keep count of hits and Xs
• how to report the hits and Xs
• how to record the hits and Xs

Tips for Classroom Timings

Use Counter's Deck	Each person's deck will have a slightly different feel. Since the learners will ultimately be demonstrating their fluency with you the teacher and using one of your decks, they will gain experience from using a different deck in their classroom timings. Always using their own deck would not provide this experience in generalizing.
How to Shuffle	This procedure for shuffling has been the most efficient we've discovered: • Split the deck in approximate halves • Hold one half in each hand with one convex (like a turtle shell) and one concave (like a sagging rope) • Using the thumbs, apply and release tension to allow the two halves to intermingle
How to Hold, Turn and Place the Cards	Some learners develop awkward card-turning habits which hinder their speed. Watch for such behaviors in the early going to prevent habit patterns that will be hard to break. Encourage learners to steady or hold the deck with one hand and turn a card with a simple short counter-clockwise motion, placing it on table or desk.It can be either straight ahead or to the side, depending on the position of the counter. The card back should be right-side-up for the counter to easily see the answer.
Landing Platform	Counters should designate a spot where they want the behaver to place the turned SAFMEDS. This should be close enough to see clearly! While it sounds obvious, some partners will situate themselves so that the counter has no chance to monitor the correctness of what the behaver said.
Say the answer clearly	Behavers need to say answers loudly enough for their counter to hear them. Some behavers will have been operating in a See-Think mode rather than a See-Say mode in their practice outside class. This should be commented on by you because these are two different behaviors and in class performance will always require See-Say.
Counting Hits and Xs	The counter monitors hits (corrects) and Xs (misses or skips). This can be done in several ways: • using a tally sheet and tallying hits and Xs • physically sorting the piles, moving Xs to a different spot after behaver has placed card down • keeping track in one's head, repeating total hit count and X count after each card has been placed Note: For the number of timings you will likely be doing as a teacher, you may want to invest in a pair of hand held tally counters. These are available in office supply stores for about $7 apiece. The best brand we've found is Rogers.

Reporting, Recording and Charting Timings

Reporting SAFMEDS hits and Xs

Once a 20-second classroom timing has been completed, the counter reports the result of the timing to the behaver, giving the number of hits first followed by the count of Xs.
Examples:
• 2-9
• 7-7
• 14-3
• 17-0
• 18-4
Note that the second count is <u>not the total</u>. Both counts are independent.

Recording SAFMEDS Timing

We typically have students keep a Daily Timing Record Sheet for their SAFMEDS timings outside class. A sample appears as a Microsoft Excel® file in the Appendix.
We had an in class log on which, among other behaviors, the in class SAFMEDS timing result was recorded. On the in class log, we had the counter "sign in" beside the recorded results, so an inspection would show if students were failing to follow the "new partner every day" rule. A sample of this sheet appears in the Appendix.

SCC monitors SAFMEDS Learning Picture

The Standard Celeration Chart (SCC), invented and developed by Og Lindsley and associates and used in Precision Teaching, will conveniently allow students to monitor their SAFMEDS progress and see their Learning Pictures develop. The Frequency of a learner's hits across time allows a Celeration pattern to emerge, along with Bounce, Jumps, Turns and Outliers. The Frequency of Xs across time generates an independent pattern with these features. Combining the hit and X Celerations produces a Learning Picture which gives teacher and learner feedback on what to do next (Graf & Lindsley, 2002).

Script for Classroom Timings

Script provided

The class timings are timed by you, with half the students as behavers and half as counters on the first 20-second timing, and roles switched on the second timing. The directions and cues make a script that you can use or modify to your liking.

Early and later script versions

This procedure has worked well in classrooms of up to 185 students. At some point you will be able to switch to the shortened form of instructions shown on the right as students learn the routine.

Beginning Script	Later Script
"Get ready for today's SAFMEDS Timings"	"SAFMEDS"
"Pair up with a partner you haven't worked with before"	"Pair up"
"Who doesn't have a partner?"	same
"Decide who's going first"	skip
"Use the counter's deck; counter shuffle the cards"	skip
"Place the cards in the hands of the behaver"	skip
"Counter get a landing platform ready"	skip
"Who is not quite set?"	"Not set?"
"All set? Engage"	"All set? Engage"
When timing device beeps after 20 seconds: "Please stop"	"Please stop"
"Counters count and report hit count and X count"	skip
"Put those counts on your scoresheet and chart them"	skip
"Switch roles. Counters become behavers and vice versa"	skip
"Get ready for the second timing"	skip
"Use the counter's deck; counter shuffle the cards"	skip
"Place the cards in the hands of the behaver"	skip
"Counter get a landing platform ready"	skip
"Who is not quite set?"	"Not set?"
"All set? Engage"	"All set? Engage"
When timing device beeps after 20 seconds: "Please stop"	"Please stop"
"Counters count and report hit count and X count"	skip
"Put those counts on your scoresheet and chart them"	skip

Notes

With all behavers saying answers out loud, organized chaos exists for each 20-second-timing. You'll be able to easily detect fluency development in the class by the noise generated.

Performance Standards

Grading	The weight one gives to achieving SAFMEDS fluency depends on how one sets up one's grading system. How one scores less than fluent performance also depends on one's grading philosophy. We found it helpful to reward learners with bonuses based on how soon fluency was reached. Those who reached fluency early in the term received big bonuses. Bonuses decreased until those who waited for the last day received no bonus.

Grading SAFMEDS performance: Speed	Over wide ranges of material, when development of SAFMEDS conforms reasonably to optimal examples: 　　• Speeds of 60+ hits (corrects) per minute will be achieved by some learners 　　• Speeds of 50-59 hits per minute provide a reasonable "A" level for speed 　　• Speeds of 40-49 hits per minute provide a reasonable "B" level for speed 　　• Speeds of 30-39 hits per minute provide a reasonable "C" level for speed 　　• Speeds of 20-29 hits per minute provide a reasonable "D" level for speed 　　• Speeds of less than 20 hits per minute indicate early stages of learning

Grading SAFMEDS performance: Accuracy	Over wide ranges of material, when development of SAFMEDS conforms reasonably to optimal examples: 　　• Reasonable accuracy equals 5 hits for every miss or skip 　　• Less than 5 hits for every miss or skip doesn't pass accuracy criterion

Grading SAFMEDS for Fluency	Fluent performance on SAFMEDS consists of: 　　• Combination of accuracy and speed 　　　　• Accuracy of times 5 or greater 　　　　• Speed of 50 per minute or greater 　　• Speed alone if 60 per minute or greater

20-second timings	Using 20 second timings, hit and miss counts are multiplied by three to equate to the per minute standards. Since accuracy reflects a ratio of two counts, no adjustment is needed. Examples: 　　• 17-3 = fluent performance (51-9 per minute) 　　• 17-4 not fluent; 51-12 doesn't meet accuracy criterion of x5 　　• 16-2 not fluent; 48-6 doesn't meet speed criterion of 50 per min.

Learning Disabilities and Legal Rights

Learning Disabilities	Fluent performance comes more easily for some than for others. Most everyone can succeed with "sufficient practice." While the defining research has not been run, our belief stemming from a large number of cases with learners diagnosed "learning disabled" is this: the SAFMEDS spectrum of repeated daily practice, fluency aims, and timings done with peers as well as with teachers provides a structure that will allow these learners both success and generalization to other learning.
Counting best performance	We have typically allowed all learners multiple timings without penalty. We have also counted learner's "best," rather than averaging across performances on a a given day. Our belief based on numerous cases: students who have put in the required practice and can perform fluently on their own decks will sometimes need to overcome self-defeating thoughts or inner editing before saying answers. We believe successes can provide a self-empowering experience.
Fluency benefits	We believe fluency training will benefit all learners and that it is probably **vital** for "learning disabled" individuals. Daily practice on a task such as SAFMEDS may provide a crucial boost in both ability and self-confidence. Case histories support this assertion, but research is needed to back our experience.
Legal Rights	Legal rights help protect individuals diagnosed learning disabled from unrealistic aims and expectations. An example would be guidelines set up providing "time and a half" for tests. How should such guidelines be viewed from a fluency viewpoint, specifically involving SAFMEDS? Here is how we have approached this issue: • timings are timings, not tests • everyyone needs to meet speed and accuracy criteria to reap fluency benefits • we extend the calendar time by time and a half, rather than clock time
Success stories	We found time and again that individuals diagnosed "learning disabled" were capable not only of achieving SAFMEDS fluency, but were frequently among the quickest in a class to achieve it. Many of these individuals (college students) became strong fluency advocates, often outspoken in their support.
Drops	In college classrooms, some students will make choices based on comfort rather than empowerment. Confrontation with fluency tasks such as SAFMEDS often drove these students to scurry to the registrar as soon as they found out that something different was being done.

SAFMEDS Records

World Class Performers

While fluent performers will achieve fifty-plus hits per minute, occasionally students will push themselves to see how fast they can become beyond the lower limits. While such cases of such "super fluency" have been rare, providing appropriate recognition such as a "Hall of Fame" and keeping records may promote these attempts.

Record SAFMEDS Performances

General Psychology SAFMEDS:
- Counts: 97 hits, 0 misses
- Time: 57 seconds (finished entire deck)
- Frequency = 101 hits per minute
- Record holder: Ken Etzold, Fall 1984

General Psychology SAFMEDS:
- Counts: 37 hits, 0 misses
- Time: 20 seconds
- Frequency = 108 hits per minute
- Record holder: Dane Snyder, Fall 1995

Standard Celeration Charting SAFMEDS
- Counts: 30 hits, 0 misses
- Time: 20 seconds
- Frequency = 90 hits per minute
- Record holder: Shawn Datchuk, Fall 2003

Fluency Opportunities

Logistics	Since you're trying to get all your learners fluent with their SAFMEDS decks, and you want them to demonstrate that performance with you on a standard deck, you might anticipate a logistical nightmare within your classroom. Such will not be the case.

Regular class timings	During the two 20-second timings in class each day, you may opt to have one or two students do a timing with you. These opportunities generally won't be needed the first week while you're monitoring the class to see that the various rules are being followed. After that you can make good use of the timing opportunities. • Students volunteer when they think they're ready or want the experience • You can use one timing with a student who doesn't have a partner if there happen to be an odd number in class on a given day

Special days	You may choose to designate a day when you have everyone do a timing one-on-one with you. Learners who have already achieved fluency can be given free time or other alternatives. In college classrooms, getting to leave class early was a possible consequence welcomed by most.
	Tips:
	• Designate order in advance or, keep them on their toes in anticipation
	• Choose location to which they come (special chair or desk convenient to you)
	• Use track meet style announcements
	  • Who's up
	  • On deck
	  • In the hole
	• Have on deck person wait in physical proximity to speed process along
	• Announce each timing with the usual "Get set" and "Engage
	• Have everyone alternate being a behaver and counter as they wait their turns
	• Pair up with partners, repair as needed
	• Record result of each timing
	• Acknowledge fluency accomplishments

Other times	You may want to make other times available for students to do voluntary timings with you when they feel they're ready. Since the timings are are only 20 seconds, several can sometimes be done waiting for the bell at the start or end of class. We learned to set a 10 timing limit per person per day. You may set your own limit rules as the learners seek a successful fluency timing.

Last day	You may designate a "last day" for achieving SAFMEDS fluency for a term. Anyone already fluent would be exempt. Run similar to a special day, except you may want to set a limit for the number of timings, rather than having just one per learner. We have often designated a time limit and then conducted rounds within that limit, where learners get one opportunity per round, then recycle. Once they achieve a fluency timing, they're out of the loop.

Use-12

Consider

Overview

Introduction   We've attempted to help you become familiar with what we've learned about the development, production, and use of SAFMEDS as a fluency tool over the past 20 years. In this section let's consider some other issues and ideas in which you may also be interested.

In this section

Topic	See Page
Overview	Consider-1
Research Questions	Consider-2
Practice Sheets	Consider-3
Other Fluency-based Tools	Consider-4
Side Effects	Consider-5
Suggested References	Consider-6

Research questions

Introduction Fluent behavior supposedly leads to retention, endurance, application, performance standards, and stability (Haughton, 1972; Binder, 1988). Additional benefits include fun, understanding and no cheating (Lindsley, 1990). Memory aids for these features occur as "REAPS FUN".

Retention If high fluency produces longer retention, what precise descriptions of retention over time exist? In a pilot study we conducted about 1990, we had students do a SAFMEDS timing approximately a year after taking General Psychology. They had no forewarning of the task and no study time. Jump downs in frequency correct ranged from ÷3 to ÷10. This indicates that performance on SAFMEDS does not maintain without practice.

A student from an Applied Behavior Analysis course continued one timing a week for about ten weeks beyond the end of the course. SAFMEDS hit frequency decelerated by about ÷1.05 per week.

Application How much more efficient will subsequent performance and learning be when prior performance has reached fluent levels? The Morningside Model of Generative Instruction (Johnson & Layng, 1992) has researched a number of aspects of this question at Morningside Academy in Seattle. I don't know to what extent SAFMEDS have been incorporated in their approach.

Performance Aims For any specific subject matter and corresponding set of SAFMEDS, what performance aims maximize fluency benefits? Or how does one establish such performance aims? At this point it has been rare for teacher education leaders to encourage SAFMEDS use, much less support research on these questions.

Stability What indications have appeared that SAFMEDS fluency produces greater stability of behavior? One indicator seems to be that we can sample a person doing SAFMEDS for 20 seconds and obtain reliable per minute frequencies. Successive trials with a shuffled deck over hundreds of students have replicated this observation.

FUN How can anything as stressful as SAFMEDS be fun? Those who achieve fluency have consistently rated the course involved as between 2X and 1000X more fun than other courses they've taken. Understanding and No Cheating represent topics covered under SAFMEDS use.

Learning Disabilities We mentioned that in our experience, students labeled "learning disabled" who were willing to follow the guidelines for SAFMEDS success were indeed successful. This would be important to show in a research setting.

Practice Sheets

Introduction

Practice Sheets represent a procedure to promote fluency in verbal behavior developed by Eric and Elizabeth Haughton and Harold Kunzelmann about 30 years ago. Learners see a wide sample of problems concerning a topic and attempt to produce appropriate responses during a timed interval. Practicioners construct auxillary sheets with questions and answers or answers alone, which can be used for monitoring learner performance. Use of the techniques provides an efficient way to provide monitored practice toward fluency with sufficient examples and nonexamples.

Types

Practice Sheets can be created by:
• hand—using cut and paste methods
• computer program—item set shuffled to complete page after being entered once

Item sets can be:
• text
• graphics

Learning Streams Compared

Higher frequencies typically occur on Practice Sheets compared to SAFMEDS. Looking at the Learning Streams involved helps analyze the difference.

SAFMEDS 4 stage 3 channel stream where fluency aims have occurred:
• Verbs   Slide-SeeSayPlace

Practice Sheet 3 stage 3 channel stream where fluency aims hav occurred:
• Verbs   SeePointSay

Learners can point to successive parts of a Practice Sheet more quickly than they can slide and place SAFMEDS cards.

Practice Sheets by Zero Bros.

Zero Brothers developed and produced "PracticeSheeter" in the 1980s for the Apple II, DOS and Macintosh platforms. In 2005, PracticeSheeter was released for Windows and Macintosh using Microsoft Word® and Microsoft Excel® templates.

Other Fluency-based Tools

Introduction

At the heart of all fluency-based monitoring and measurement lies the Standard Celeration Chart . Other tools include text or graphics practice sheets, tasks such as free-write, free-abreviate, and sets of organizing principles.

Standard Celeration Charts

Standard Celeration Charting provided the precise monitoring and measurement tool which led to discoveries in fluency. Developed by Ogden Lindsley in the mid-1960's, increasing numbers of individuals have realized its benefits for comparison and discovery. Workshops have been offered for a number of years at the Preconvention Institute of the Association for Behavior Analysis as well as at The International Precision Teaching Conference. Examples of SAFMEDS charted on SCCs will be found in the Appendix.

The Free-Write Task

The Free-Write task consists of a timed writing which the learner has prepared beforehand with organization and practice. During the actual timing the learner has no notes for reference. Unlike an exam in which the instructor chooses the questions from the material covered, in a Free-Write the learner has the freedom to select what material seemed most important and organizes it. Once a week or daily three or five-minute timings provide a sample by which to monitor the learner's behavior. Free-Writes of a class of thirty can be graded in five to six minutes. Feedback occurs as follows:

Effort	Score
Impressive in amount of material organization, and detail	plus
Satisfactory in amount of material and organization	check
Marginal in amount of material or organization	minus
Insufficient amount of material or lack of organization	X

The Free-Abbreviate Task

The Free/Abbreviate task—usually a one-minute timing—has been most extensively used by Haughton and Lindsley to monitor a group's individual performances. When done at the start and finish of a workshop as a pre- and post- exercise, an idea of workshop effectiveness can be obtained. The participants each abbreviate facts known about the topic being covered for one minute, then take turns explaining their abbreviations to a partner. Counts of the number of facts are voiced by each partner and the workshop leader tallies the counts on a Standard Celeration Chart. The spread of responses is thereby viewed, as well as the gains made over the course of the workshop.

Basic Concepts

A set of concepts covering a topic area serves as a structure into which SAFMEDS can be grouped or organized. The concepts are stated as simply as possible and can be set up at several levels, so a student need only remember five concepts but chunks up to five other concepts within each of those. These are practiced orally in one minute timings until fluency criteria are reached.

Side Effects

Pressure

Some learners complain about the pressure of performing in front of the teacher in a one on one setting. As a general finding, these learners are performing at frequency levels below fluency. Sometimes there practice methods are deficient. Examples would involve See-Think rather then See-Say practice, or not shuffling the SAFMEDS deck after studying the cards.

Encourage learners to follow the SAFMEDS guidelines. Encourage learners to visualize themselves in the performance situation when they practice. Or—encourage learners to visualize themselves in their practice setting when they perform.

Carefulness

Some learners appear to "edit" what they are about to say for correctness, rather than just saying it. Such inner behavior jumps down their frequency from what they claim to have accomplished in practice. Occasionally this involves the learner starting to say an answer and then suppressing it in mid-word.

Encourage learners to "let the behavior happen".

Focus

Some learners will make drastic improvements from one timing to the next within the same session, achieving fluency levels after struggling previously. These students appear to gain a highly focused set, where before they had been responding to "pressure" or "carefulness".

They sometimes comment on the change in their behavior. The fluency that they achieved in their practice environment now finally appears in the performance environment after initial failures.

Comment

Some might argue that the side effects resulting from the SAFMEDS experience provide a more important effect than becoming fluent with a particular content area. As one becomes aware of what one can do, the boundaries of one's expectations change.

Suggested References

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Appendix

Overview

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Describing a Daily Timing Record Sheet	Appendix-2
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Describing a Daily Timing Record Sheet

Introduction	A Daily Timing Record Sheet can help learners develop daily self-timing habits. Learners monitor their own performances outside class on this sheet. A sample such sheet is included as a Microsoft Excel® template.
Day and Week	The first column shows the day of the week and week for the first three weeks of the term. The sample sheet covers a 9-week period Weeks 4-6 and 7-9 are shown in columns to the right. Names of the days of the week are not repeated.
Hits and Xs in 20 sec.	The "hits" or "corrects" refers to the one sample timing that the learner chooses to report for the day. The X count refers to the total "misses" and "skips" that occurred on the same timing. The learner's choice may be any timing done that particular day. Many learners prefer to report their "best" (highest frequency), but one could report the "worst" or the "first" or the "last" or some other.
20 sec. timings	Timings are standard at 20 seconds, since this is the duration used in classroom timings as well.
Timings	Timings refers to the number of timings a learner actually does each day, even though only one sample will be reported. We suggest 10 timings be done each day on a deck, with a minimum of 1 timing per day. One timing per day doesn't move one toward fluency but it seems to keep one from getting worse.
Aim	Aim refers to the aim frequency and represents a target frequency for the learner to reach each day, based on the ultimate fluency aim for the deck (typically 50 per minute) and when the teacher or trainer wants everyone to reach that aim. In the sample Daily Timing Record Sheet: • a few days consist of 1 per minute aims as learners acclimate to timings • a formula determines the daily aim based on a constant daily multiplier • the aim for reaching 50 per minute (17 in 20 seconds) was set at Friday of Week 6. The formula is shown in Column U Row 22 of the spreadsheet.
Time Stamp for 0th Sunday	Standard Celeration Charts cover 20 weeks. A spot for all to time stamp their DTRS is found in the upper left corner of the sheet.
Performer	A space for the learner to record hir name is located at the upper right of the sheet.