Ogden R. Lindsley

Standard Celeration Chart Workshop

Behavior Research Company, 2000

2446

# Standard Celeration Chart Reading


## Ogden R. Lindsley

Behavior Research Company
366 North 1600 Road
Lawrence, KS 66049-9199

Voice (785) 887-6869
Fax (785) 887-6779


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Notes and ideas:

## In this module you will:

- Read values, and relationships directly from Standard Celeration Charts (SCC).
- Practice paced, choral, point-see-say loudly at 60 per minute.
- Request coaching by your instructor.
- Question **everything** unclear to you.
- Demand an answer you can understand.
- Write the answers in your manual.
- Make this module yours!

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Notes and ideas:

## In this module you will not:

- Fail to point to each Standard Celeration Chart on the practice sheets.
- Fail to say loudly enough to be heard by your coach at the end of the row.
- Wait until the page ends to question.
- Fail to ask ridiculous questions.
- Keep this manual unmarked and virginal.
- Write notes in other places.
- Fail to make this module yours!

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Notes and ideas:

## Your goals are:

- Reading SCC values at low frequencies over 5 correct per minute as a start for practice.
- Regular daily practice will bring you up to fluent SC chart reading above 60 per min.
- To See and Say:

| | |
|---|---|
| Symbols | Frequencies |
| Counting Times | Proportions & changes |
| Celerations | Performance Picture |
| Change Effects | Bounce |
| Outlier Probabilities | |

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Notes and ideas:

## Standard Chart Symbols

- From our very start in 1965, we not only standardized our chart size and scales, but also our charting symbols and conventions.
- Acceleration targets = dots, solid line, green. Deceleration targets = "x", dashed line, red.
- Aim stars point in the direction to go and at the day the aim must be met.
- Aim star arms are on the frequency aimed at.
- We show symbols in the next diagram, and practice some on the next sheet.

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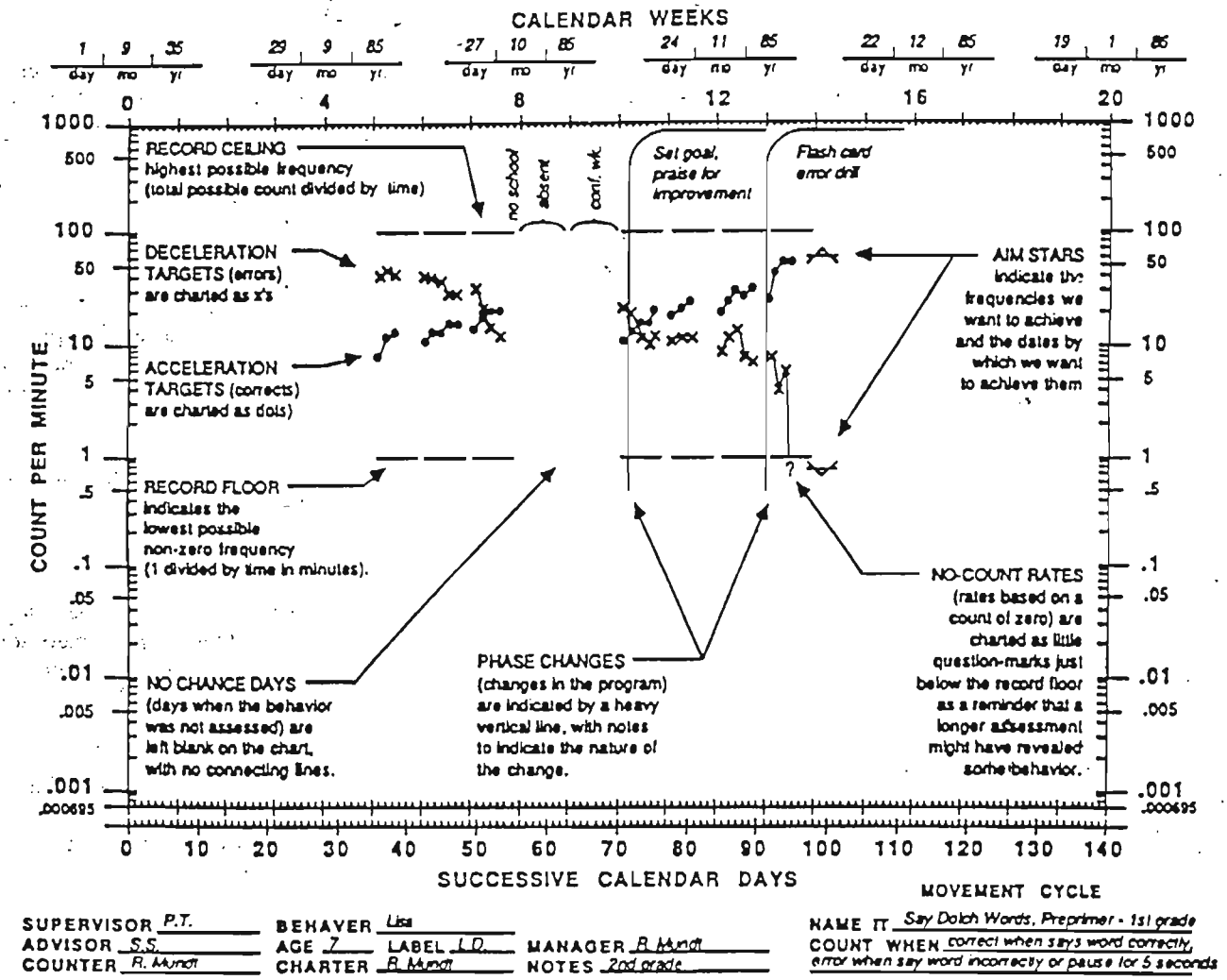
Notes and ideas:

## STANDARD CELERATION CHART AND CHARTING CONVENTIONS

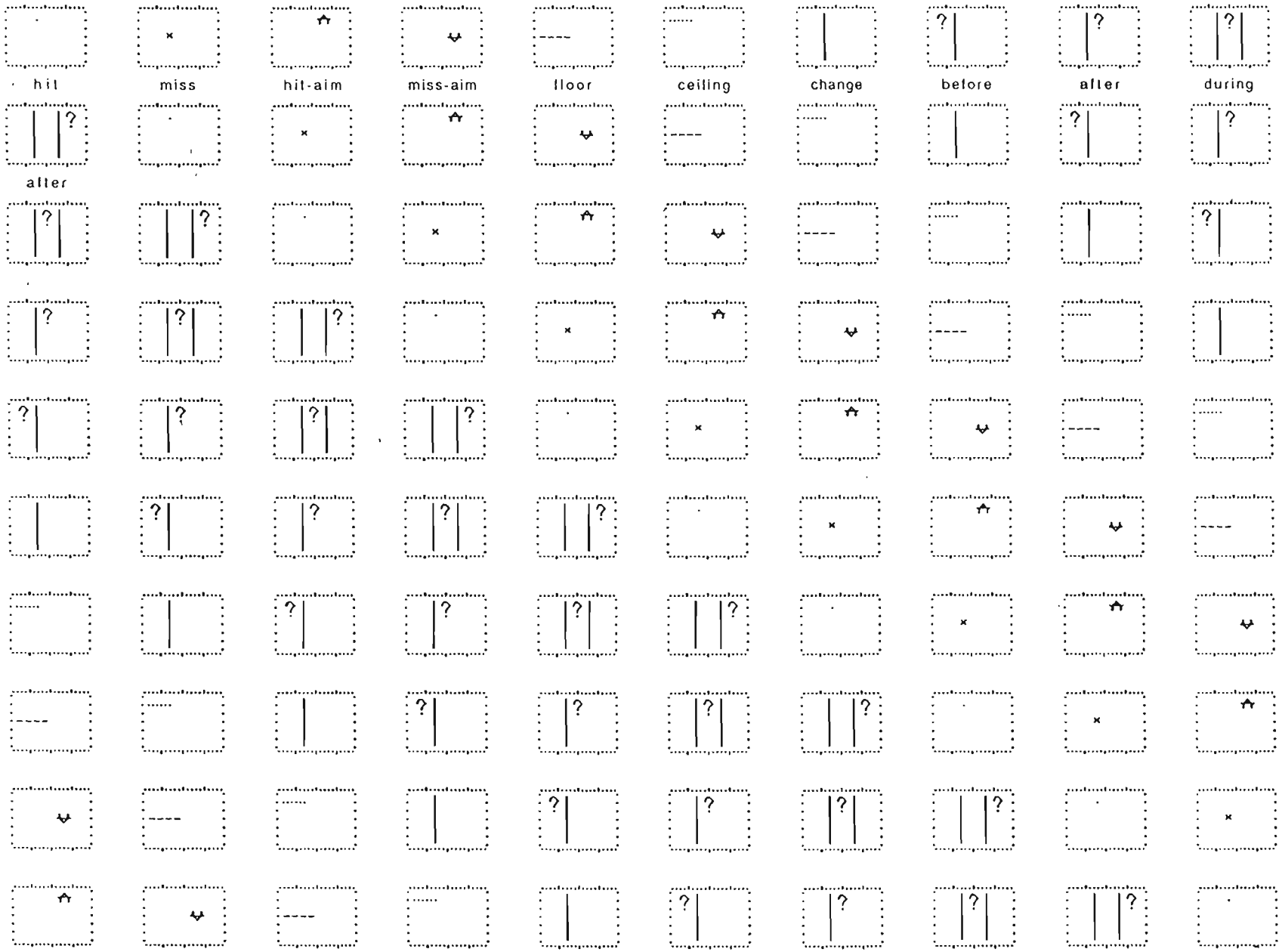



From "Precision Teaching—Precision Learning" by O. R. White, 1986, *Exceptional Children*, 52, p. 529. Copyright 1986 by The Council for Exceptional Children. Reprinted by permission.

Name _____ Date _____

Point Say the symbol name (hit, miss, hit-aim, miss-aim, floor. ceiling, ...).

SCC Symbols
Num Ord, Page 1
Pics = 11




READING-5B

## How to read Frequencies

- A frequency is a dot on all SC charts.
- Each practice sheet has 100 mini-SCCs.
  Up the left of each are 7 dots.
  Each dot is x10 above the one below it.
  Going up they are 1, 10, 100, 1000, 10,000, 100,000 and 1,000,000 per day.
- To get a feel for this, point to and say the frequency of the dot inside each mini-SCC on the next "Ref.Freqs."practice sheet.
- Your coach will pace you at 60 per minute for 10 seconds.

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Notes and ideas:

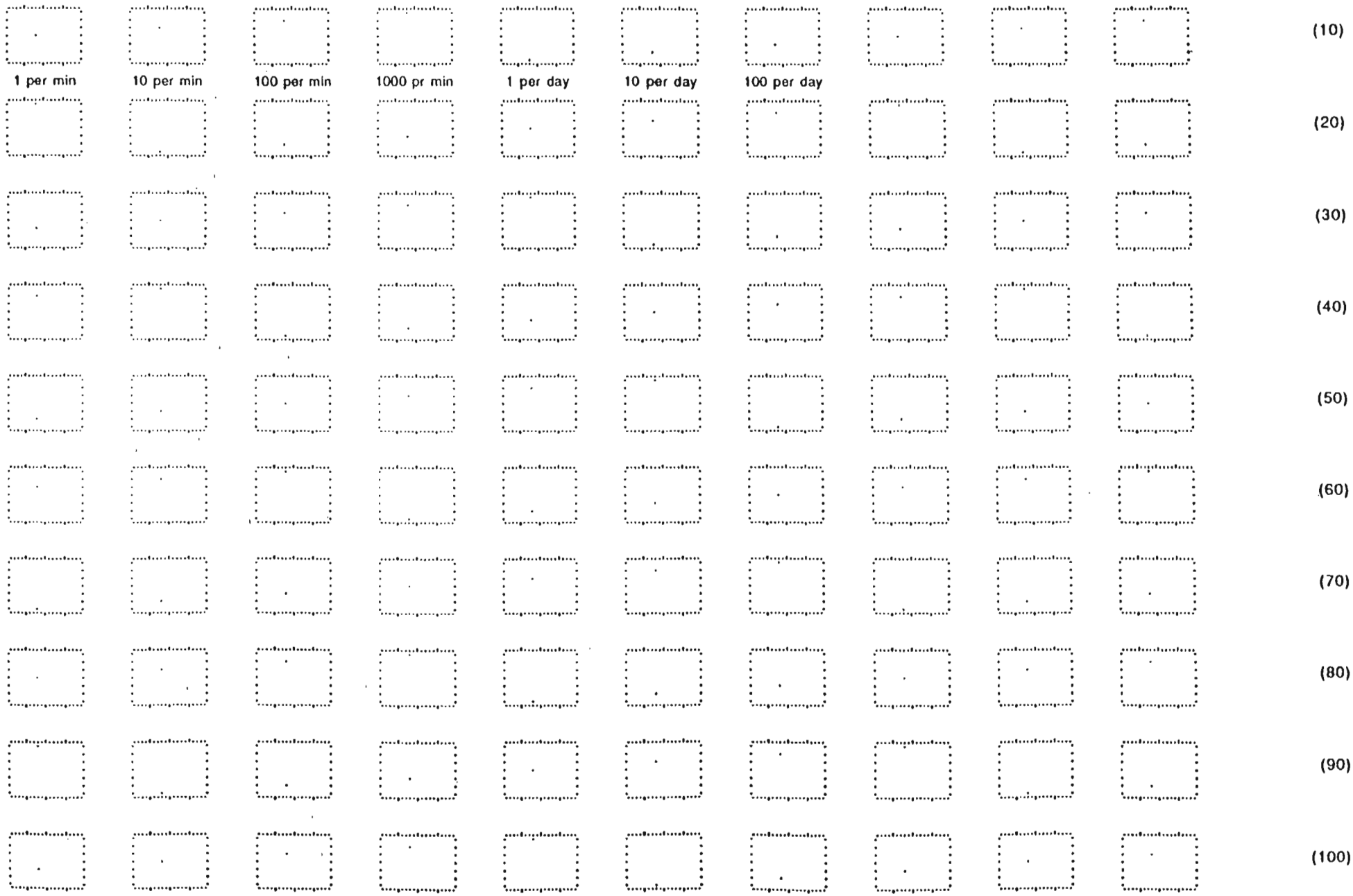
Name _____ Date _____

Ref.Freqs. x10

Point Say the frequency of each dot on the SCC: (one per minute, ten per minute).

Num Ord, Page 1

Pics = 7




READING-6A

## About Counting Times

- Counting times limit the lowest number you can count - a frequency of one.
- Counting time puts a floor on frequencies.
- Counting time floor bars show counting time length by their location on the chart.
- The right side of Dpmin lists these times.
- Longer counting times build endurance by longer and longer practice “runs.”
- Shorter counting times build fluency with short 5 or 10 second "sprints."

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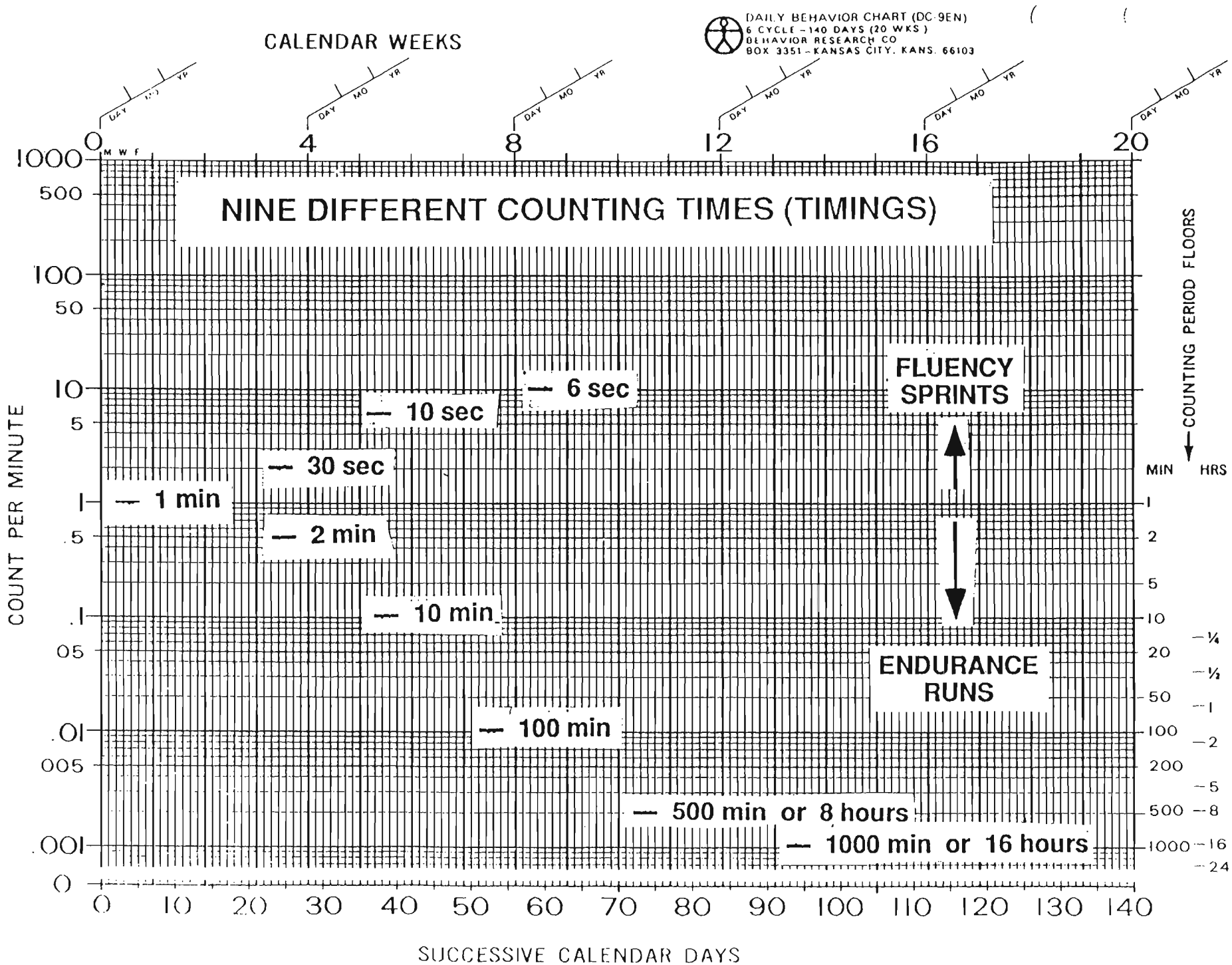
Notes and ideas:


DAILY BEHAVIOR CHART (DC-9EN)
6 CYCLE – 140 DAYS (20 WKS)
BEHAVIOR RESEARCH CO
BOX 3351 – KANSAS CITY, KANS. 66103
CALENDAR WEEKS
DAY MO YR
0 4 8 12 16 20
M W F
NINE DIFFERENT COUNTING TIMES (TIMINGS)
— 6 sec
— 10 sec
— 30 sec
— 1 min
— 2 min
— 10 min
— 100 min
— 500 min or 8 hours
— 1000 min or 16 hours
FLUENCY SPRINTS
ENDURANCE RUNS
COUNT PER MINUTE
1000 500 100 50 10 5 1 .5 .1 05 .01 005 .001 0
COUNTING PERIOD FLOORS
MIN HRS
1 2 5 10 20 50 100 200 500 1000
¼ ½ 1 2 5 8 16 24
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
SUCCESSIVE CALENDAR DAYS
SUPERVISOR ADVISOR MANAGER BEHAVER AGE LABEL COUNTED
TIMER COUNTER CHARTER

READING-7A

## How to read Counting Times

- Horizontal bars from Tuesday to Friday of each week show counting time. They look like a floor between the Sunday line walls.
- A zero frequency means count time was too short to count one. Count unknown.
- When frequency goes below the floor bar you have lost sight and don't know its size. Some draw little ? marks below the counting time floor bar for zero frequencies.
- Point-see-say counting times on the next practice sheet as your coach paces.

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Notes and ideas:

Name _____ Date _____

Point say record floor (10 sec, 1 min, 10 min, 100 min, 8 hours)

Floors x10chrt
Shuffled after 2, Page 1
Pics = 5

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | hrs? --- | --- | --- | --- | --- | hrs? --- | (10) |
| 10 sec | 1 min | 10 min | 100 min | 8 hrs | | | | | | |
| --- | --- | hrs? --- | --- | --- | --- | --- | hrs? --- | --- | --- | (20) |
| hrs? --- | --- | --- | --- | --- | --- | --- | --- | hrs? --- | --- | (30) |
| --- | --- | hrs? --- | --- | --- | --- | --- | hrs? --- | --- | --- | (40) |
| --- | --- | --- | hrs? --- | --- | --- | --- | hrs? --- | --- | --- | (50) |
| hrs? --- | --- | --- | --- | --- | --- | --- | --- | hrs? --- | --- | (60) |
| --- | --- | hrs? --- | --- | --- | --- | --- | --- | --- | hrs? --- | (70) |
| --- | hrs? --- | --- | --- | --- | --- | --- | --- | --- | hrs? --- | (80) |
| --- | --- | --- | hrs? --- | --- | --- | --- | --- | --- | hrs? --- | (90) |
| --- | --- | hrs? --- | --- | --- | --- | hrs? --- | --- | --- | --- | (100) |

READING-8A

## How to read Proportions

- The SCC is proportional paper!
  (multiply scale - multiply distance)
- A proportion is the vertical chart distance between two counts (dots).
- Proportions are symmetrical, percent is not.
- Practice reading proportions: say "x1," "x10," "x100" for how far the dot is above the "x" on the next practice sheet.
  If the dot is below the "x," say "÷10," "÷100," or "÷1000."

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Notes and ideas:

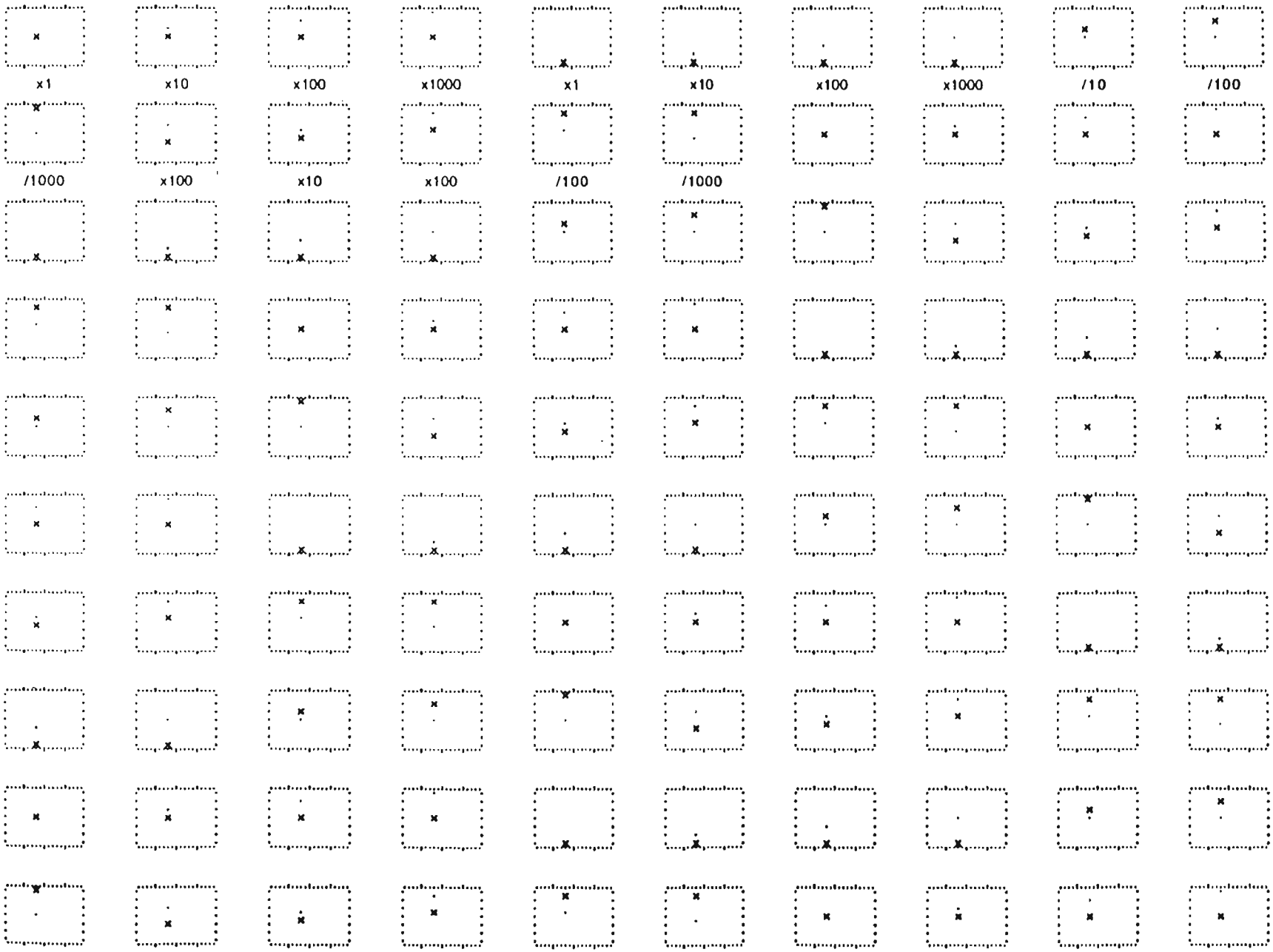
Name _____ Date _____

**Ref.Accy.Props-x10**

Point say accuracy proportion for each pair (times one, times ten)

**Num Ord, Page 1**

**Pics = 16**




READING-9A

## How to read Proportion or Accuracy Change over Time

- When proportion changes, the chart area between hits and misses changes.
- Distance between hit and miss is accuracy
- When area widens, accuracy increases.
- When area narrows, accuracy decreases.
- Practice this by saying "increase," "maintain," or "decrease" for the accuracy change in the following pictures.

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Notes and ideas:

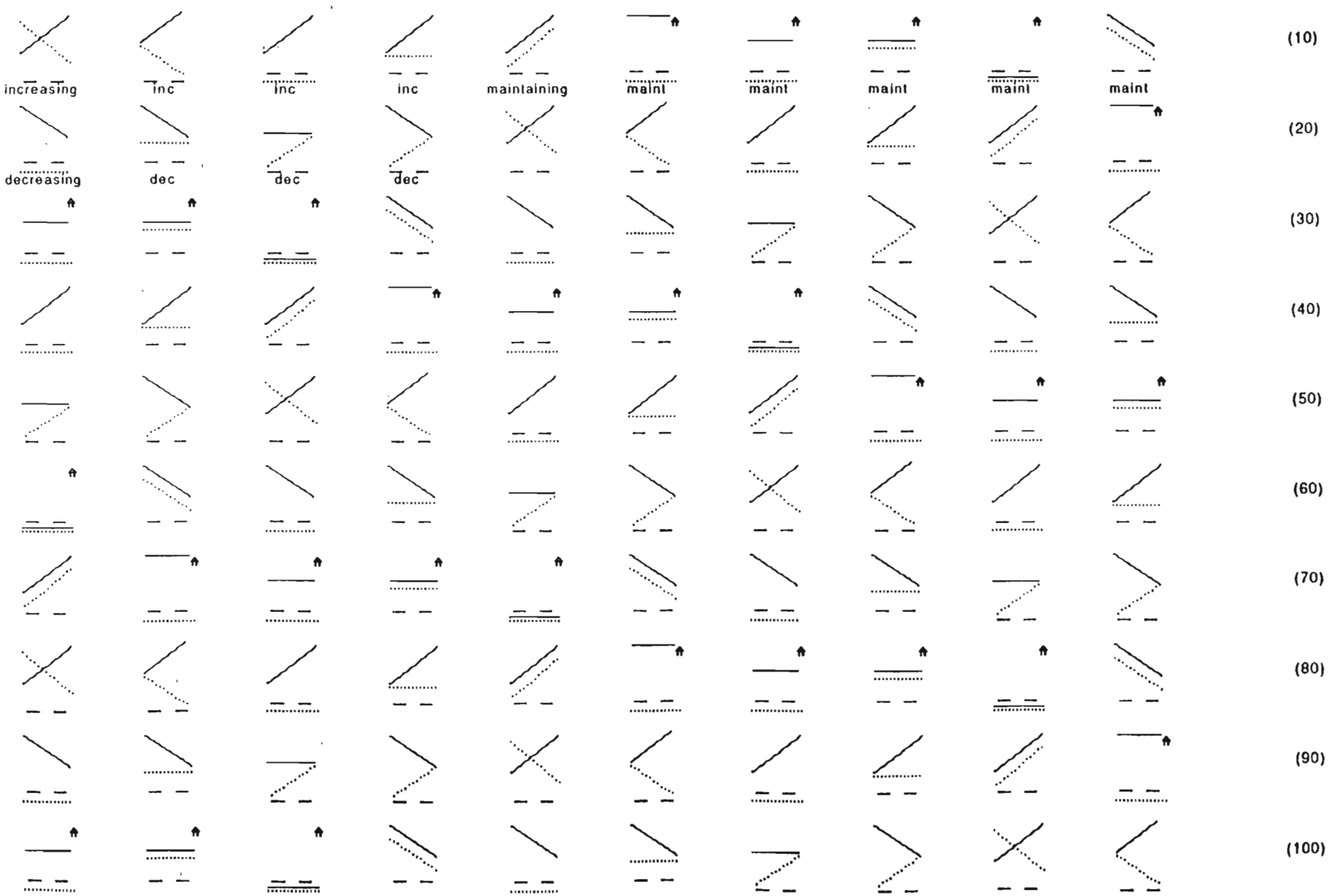
Name _____ Date _____

Perf.Pics.Prop

Point Say how proportion changes across time: (increasing, inc)

Num Ord, Page 1

Pics = 14




READING-10A

## Why learn Reference Celerations?

CELERATION™

- All four SC charts are made to have the same celerations - x2 is corner to corner.
- Since the chart spaces are proportional and standard we can learn to read celerations directly, just as we read the reference geometric angles of 30°, 45°, 60°, and 90°.
- Once we can read the reference celerations of 1.0, 1.1, 1.4, 2, 4, and 16, we can read growth and decay values on SCCs posted on walls as fast as we walk by.

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Notes and ideas:

## Skinner's Standard Frequency Charts

- Skinner designed recorders which made standard charts with cumulative number up the left, and minutes across the bottom.
- The slope of these charts was frequency.
- Their reference slopes were frequencies of 0.25, 0.50, 1, and 3 per second.
- The angles forced looking at doublings.
- Although called cumulative records, they were actually standard frequency charts.

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Notes and ideas:

## How to read Reference Accelerations

- Accelerations (slopes) are named by how much the frequency multiplies each period.
- The reference accelerations are:
  x1 ("times one"), a horizontal line.
  x1.1 ("times one point one"), line goes up times 10 distance all way across chart.
  x1.4 ("times one point four"), a line goes half way up across the whole chart.
  x2 ("times two"), line from corner to corner,
  x4, line goes all way up half way across.
  x16, line all way up one quarter across.

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Notes and ideas:

## How to read Reference Decelerations

- Decelerations (slopes) are named by how much the frequency divides each period.
- Our reference decelerations are:
  /1.1 "divide one point one", line goes down times 10 distance all way across.
  /1.4 "divide one point four", line goes half way down across the whole chart.
  /2 "divide two," down corner to corner.
  /4, line goes all way down half way across.
  /16, line all way down one quarter across.
- Point-see-say the accelerations and decelerations for each SCC on next sheet.

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Notes and ideas:

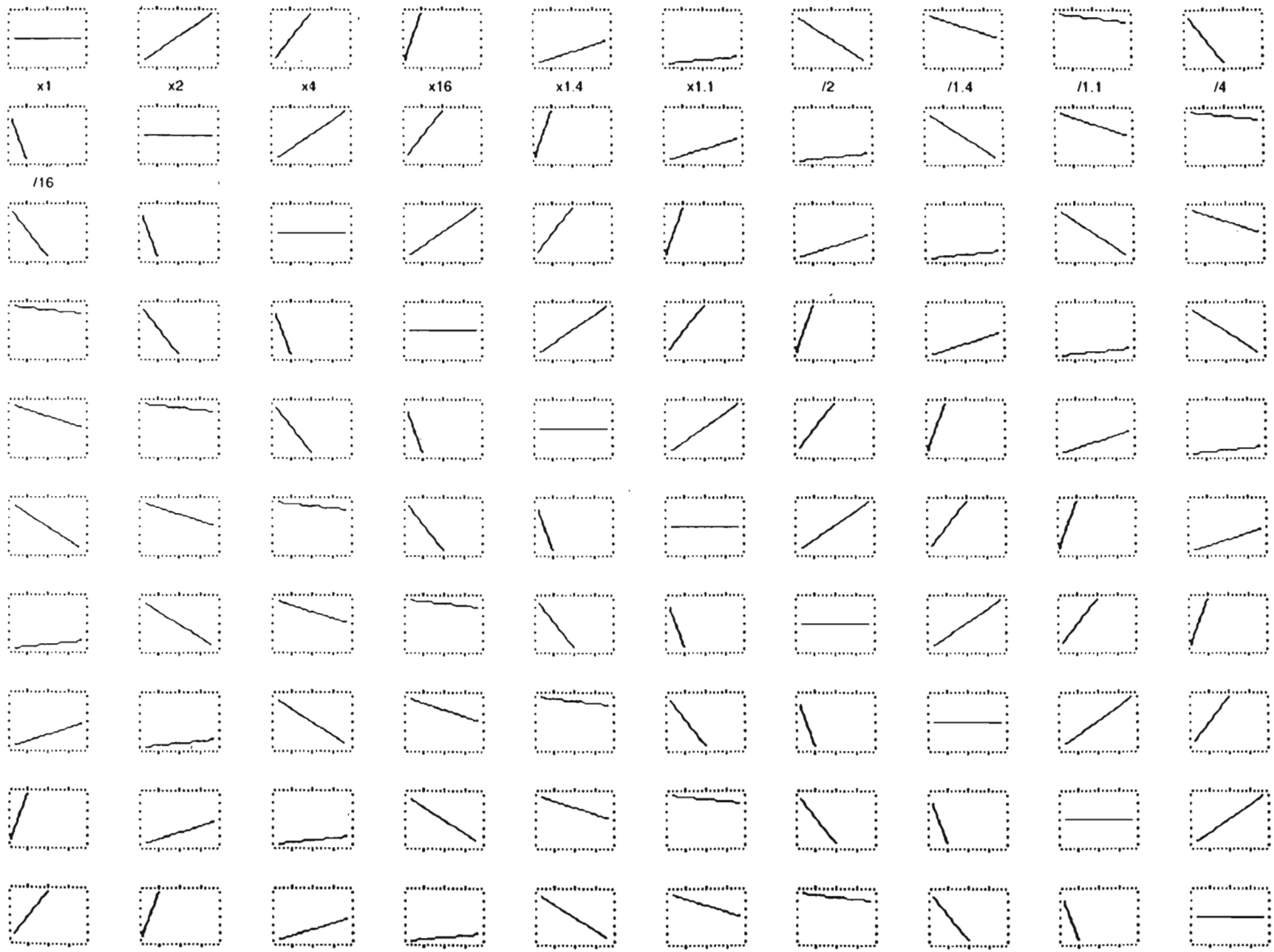
Name _____ Date _____

**Ref.Cels-Corners**

Point Say the celeration of each line (times two, times four).

**Num Ord, Page 1**

**Pics = 11**




READING-14A

Name (ID#) _____ D__ M__ Y__ Timing No. this day: __ No. of min: _

Point say the celeration under each line (times one, times two)

**Ref.Cels-Random**

**Num Ord, Page 1**

**Pics = 19**


READING-14B

## How to name Performance Pictures™

- Two line Performance Pictures™ have been usefully named by learners and workers for over 17 years.
- Names for each picture help describe performance charts in conversation, and suggest remedial methods.
- Point see-say picture names on the next practice sheet as led by your coach. A neighbor will count how many you hit and missed in 10 seconds.

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Notes and ideas:

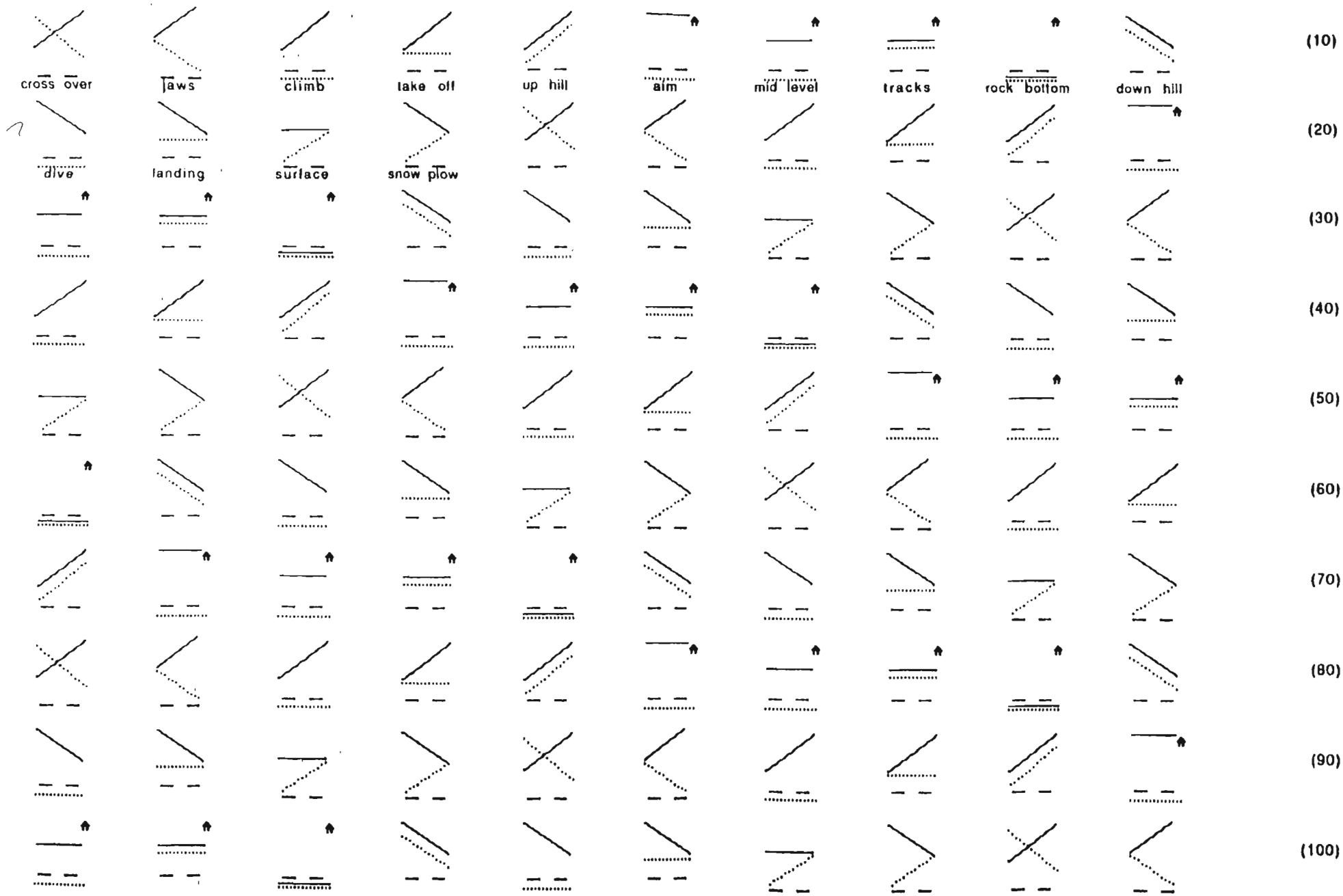
Name _____ Date _____

Point Say Performance Picture™ *name*: (cross over, jaws, climb)

**Perf.Pics.Name**

**Num Ord, Page 1**

**Pics = 14**






READING-15A

## How to name Change Effects

- Program changes always produce two **independent** effects on performance:
  A jump up or down the chart, then
  A turn up or down in the slope.
- They are called:
  "jump-up", "jump-no", or "jump-down".
  "turn-up", "turn-no", or, "turn-down".
- Jumps are changes in frequency and
  Turns are changes in celeration.
- 30% of published charts are counter turns:
  jump-up turn-down or jump-down turn-up.

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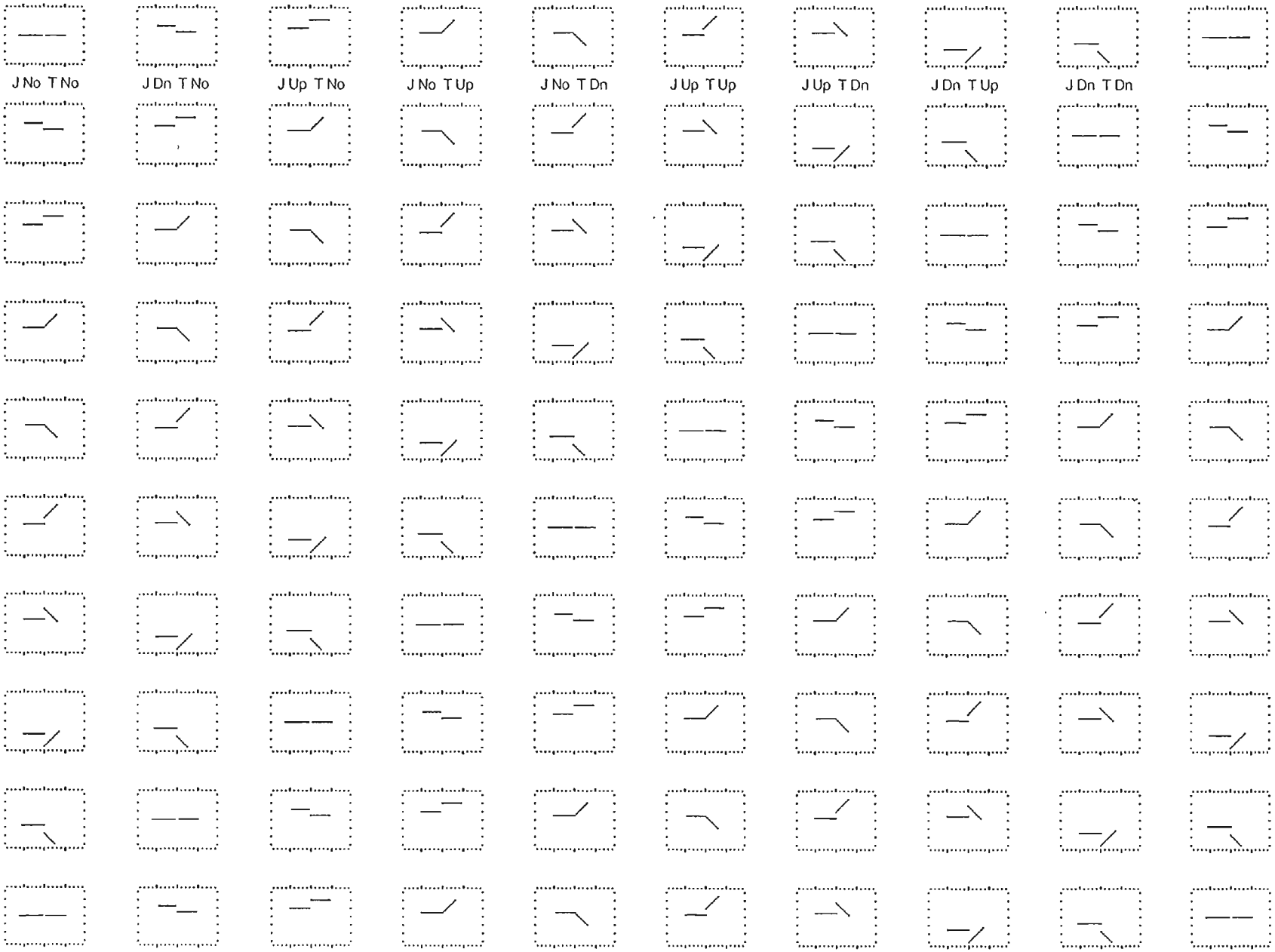
Notes and ideas:

Name _____ Date _____

Point Say the Jump-Turn combinations (Jump No Turn No, Jump Down Turn No)

**Jump-Turns x1 bef**
**Num Ord, Page 1**
**Pics = 9**




READING-16A

Name _____ Date _____

Point Say the Jump-Turn combinations (Jump No Turn No, Jump Down Turn No)

**Jump-Turns mix bef**
**Num Ord, Page 1**
**Pics = 30**


READING-16B

## How to read Turn Sizes

- When the before line and after line are in opposite directions (one accel, one decel), multiply them together x2 x /4 = 8
  and give the sign of the change. /8
- When the before line and after line are in same direction (both accel or both decel), divide larger by smaller x4 / x2 = 2
  and give the sign of the change. /2
- Paced by your coach, point-see-say the turn sizes on the next practice sheet.

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Notes and ideas:

Name _____ Date _____

Point Say the size of the turns (times one, times two).

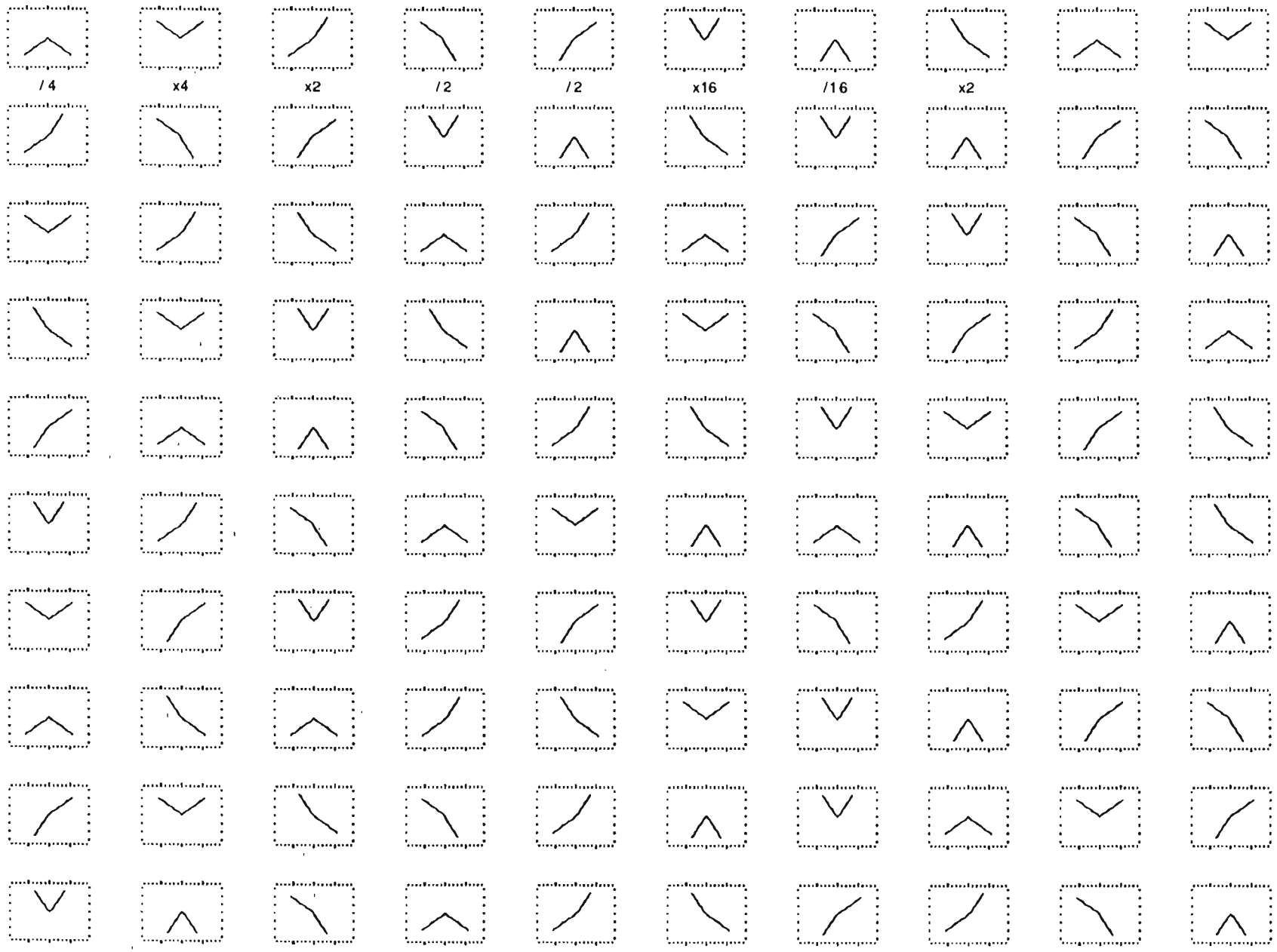
Turn Sizes X1 bef
Shuffled after 2, Page 1
Pics = 7


READING-17A

Name _____ Date _____

Point Say the sizes before-after=turn (times two - divide two = divide four).

**Turn sizes mix bef**
**Shuffled after 2, Page 1**
**Pics = 8**




READING-17B

## How to read Course Bounce

- Performance frequencies vary from day-to-day or week-to-week.
- They bounce as they move across the chart. This marks a course around the celeration line through their middle.
- This bounce is the vertical distance between the two course lines parallel to the celeration line, said as a multiple.
- Point-see-say the bounce size in each mini-SCC on the next sheet.

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Notes and ideas:

Name_____ Date _____

Point Say the bounce (height of course): (times one, times three, times five).

**Bounce x1c**
**Shuffled after 2, Page 1**
**Pics = 5**


READING-18A

## How to read Outlier Probabilities

- On a Standard Celeration chart you can easily see how far an outlier is above or below the course of other frequencies.
- This distance can be described by the number of bounces it is away.
- This number of bounces translates directly into the statistical probability that the outlier would occur by chance.
- The next slide lists these probabilities.

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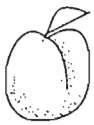
Notes and ideas:



## Probability of Outliers: Peaches or Lemons

| Bounces away from course edge: | Probability is one out of a: | (St. Dev. from mean:) |
|---|---|---|
| Half | Thousand | 4 |
| One | Million | 6 |
| One and a half | Billion | 8 |
| Two | Trillion | 10 |

Memory aid: "Half a bounce is half a ton"

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Notes and ideas:

## Practice reading Outlier Probabilities

- We describe how far something is from the **edge** of something else, but not from its middle as does standard deviation.
- Conventional statistics describes outlier distance differently from the way most of us see it, making it hard to understand.
- Point-see-say the probabilities that the outliers would occur by chance on the next practice sheet.

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Notes and ideas:

Name _____ Date _____

Point Say the outlier probability as one out of a (thou, mill, bill, trill).

OutlierProb x1c3b
Shuffled after 2, Page 1
Pics = 8

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | (10) |
| thousand | million | billion | trillion | thou | mill | bill | trill | | | |
| | | | | | | | | | | (20) |
| | | | | | | | | | | (30) |
| | | | | | | | | | | (40) |
| | | | | | | | | | | (50) |
| | | | | | | | | | | (60) |
| | | | | | | | | | | (70) |
| | | | | | | | | | | (80) |
| | | | | | | | | | | (90) |
| | | | | | | | | | | (100) |

READING-21A

Name _____ Date _____

Point say the outlier probability as one out of a (thou, mill, bill, trill).

OutlierProb x1c10b
Shuffled after 2, Page 1
Pics = 8

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | (10) |
| thousand | million | billion | trillion | thou | mill | bill | trill | | | |
| | | | | | | | | | | (20) |
| | | | | | | | | | | (30) |
| | | | | | | | | | | (40) |
| | | | | | | | | | | (50) |
| | | | | | | | | | | (60) |
| | | | | | | | | | | (70) |
| | | | | | | | | | | (80) |
| | | | | | | | | | | (90) |
| | | | | | | | | | | (100) |

READING-21B

## How to Discover from Peaches and Lemons

- Gilbert pointed out in 1978 how much we can discover from exemplary performers.
- We have extended this concept to learning what not to do from lemony performers, and also from peachy and lemony days in one worker's chart.
- A peach is a significantly good and a lemon is a significantly bad performance.
- We can discover what to do from peaches and what not to do from our lemons.

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Notes and ideas:

## Naming Peaches and Lemons

- A peach is a significantly high frequency in something we want more of.
  Or, a significantly low frequency in something we want less of.
- A lemon is a significantly low frequency in something we want more of.
  Or, a significantly high frequency in something we want less of.
- Look at the aim stars, and point-see-say peach outliers towards the aim or lemons away from the aim on the next sheet.

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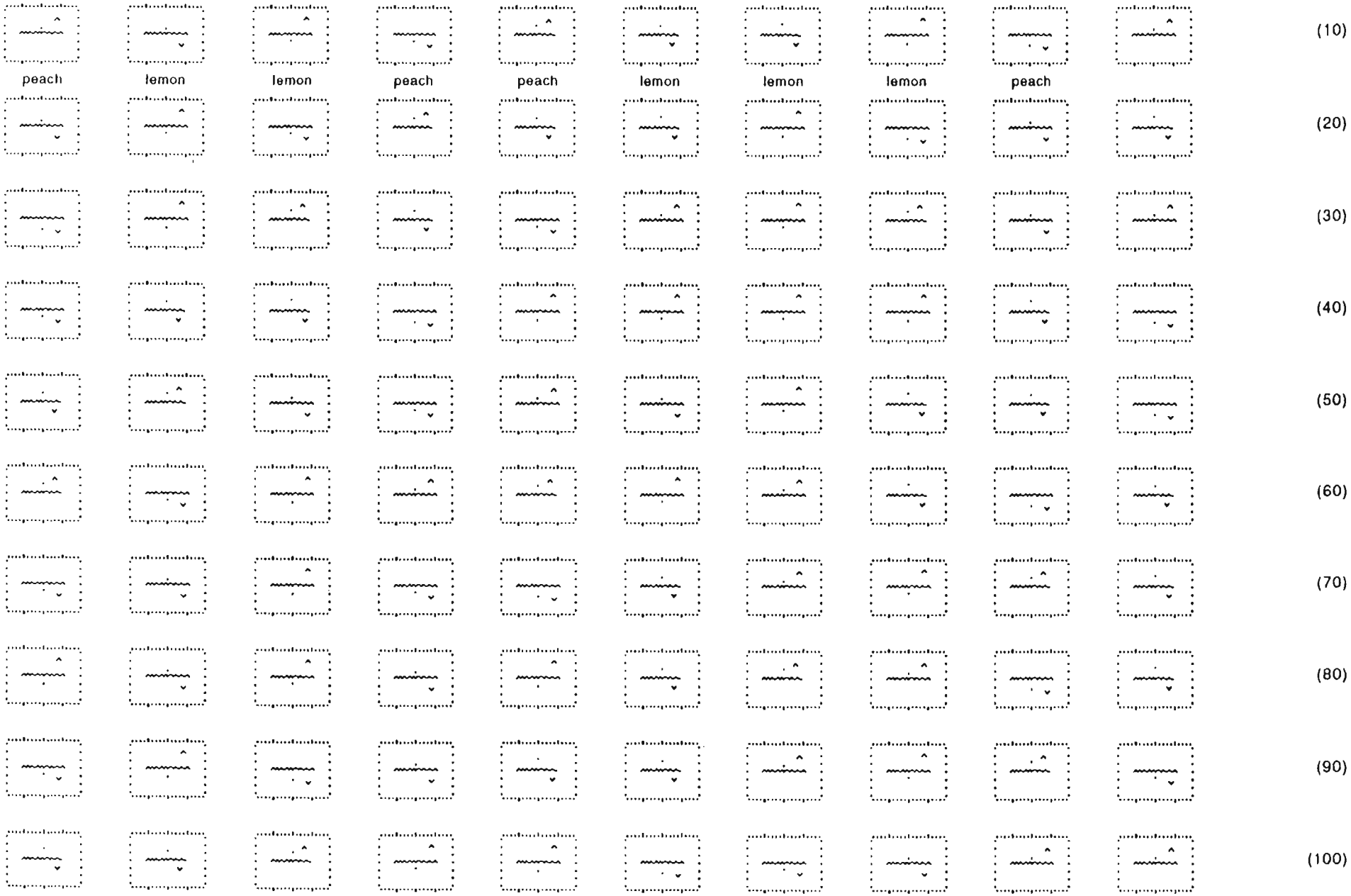
Notes and ideas:

Name _____ Date _____

Point Say whether the outlier is a peach or lemon by looking at aim star.

**Prob.Fruit x1c3b**
**Shuffled after 2, Page 1**
**Pics = 9**




READING-23A

## Reading a Monthly Chart

- The next page is a working chart of monthly billings from a training shop. In mid 1978 a 10% commission was given the manager,
- The celeration before was _____.
- The celeration after was _____.
- The effect was __ Jump __ & __ Turn __.
- The bounce was _____.
- There were __ peach(es) and __ lemon(s).
- Probability?_____ ?_____

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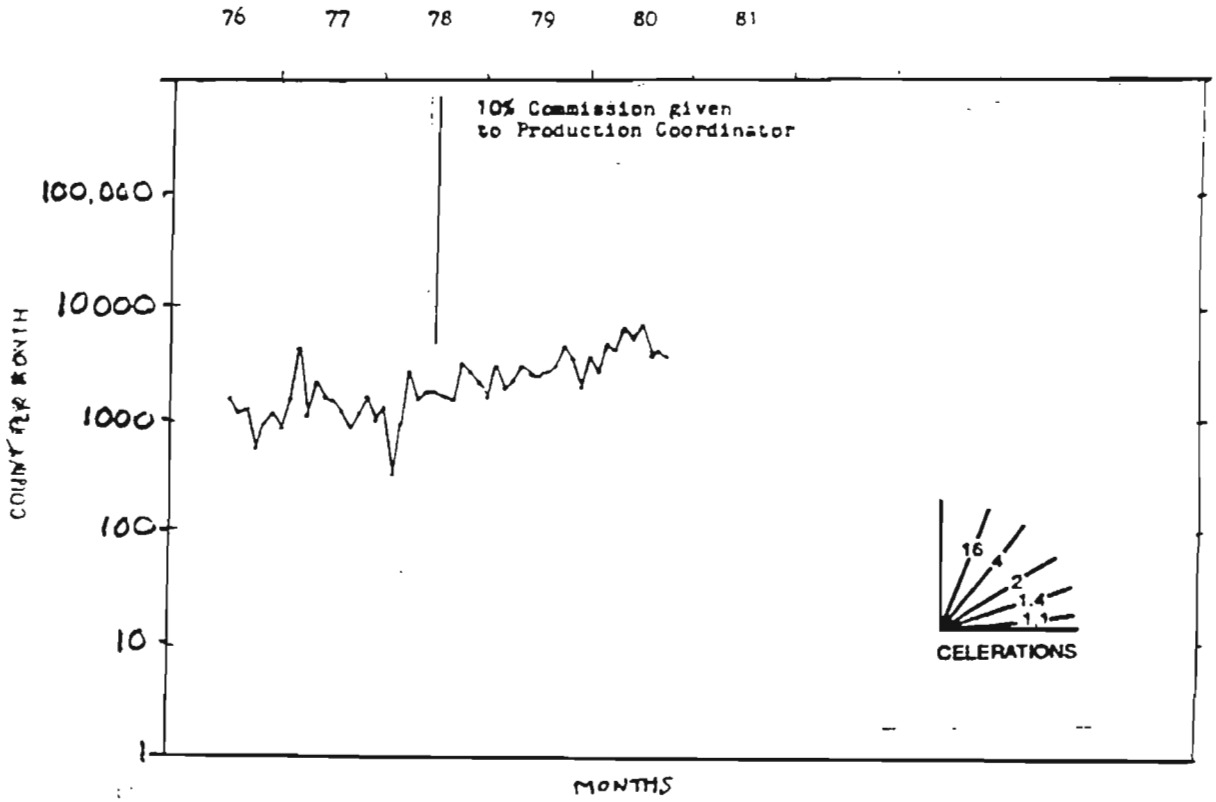
Notes and ideas:

# Effects of 10% commision on production (monthly billings shipped).




D. Andrews J. Johnson Al Eliot

COF Training Services-Ottawa & Osage City

T. McClure Jim Johnson

Production Unit
(40-50 DEV. DISABLED ADULTS)

Monthly Billings
Items Shipped
By COF

Notes and ideas:

## Closing Quotes

| | | |
|---|---|---|
| • Frequency is universal | Skinner | 1950 |
| • Self charting | Skinner | 1938 |
| • Ignore percent | Skinner | 1969 |
| • Use multiply scale | Meadows | 1972 |
| • Performance multiplies | Lindsley | 1972 |
| • Greatest effects by measuring performance | Gilbert | 1992 |
| • Performance Technology's weak link is measuring | Lindsley | 1994 |

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Notes and ideas:

## Standard Celeration Chart Set Covers All Organizational Levels

| Type chart: | Used to improve: |
|---|---|
| • Daily | - Performer |
| • Weekly | - Process |
| • Monthly | - Organization |
| • Yearly | - Nation or World |

Performance Navigation™ systems use this chart set to improve personal and company production and quality.

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Notes and ideas:

Owner's Name _____ Building _____ Room ___

# Standard Celeration Charting



## Ogden R. Lindsley

Behavior Research Company
366 North 1600 Road
Lawrence, KS 66049-9199

Voice (785) 887-6869
Fax (785) 887-6779


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## In this module you will:

- Chart on a daily, a weekly, a monthly, and a yearly Standard Celeration Chart (SCC).
- Your instructor will coach your charting.
- Compare your SC chart with the published add-scale stretch-to-fill (ASTF) chart.
- Answer questions from the charts you made.
- Discuss how your SC chart showed a different picture than the ASTF chart.
- Explain why the authors made their ASTF chart the particular way they did.

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Notes and ideas:

## Your goals are to:

- Chart frequencies slowly at 5 per min. on each of the four charts in the SCC set..
- Know that charting fluently above 20 per min. will take only a few weeks of daily practice.
- Describe what a multiply-scale does to counts over time, compared to an add-scale.
- Describe how Standard Celeration displays change the conclusions from data in add-scale stretch-to-fill (ASTF) displays.

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Notes and ideas:

## Daily SC Chart Dpmin

- **D** means daily. **pmin** means count per minute. Form, language, and paper letter codes follow.
- Day lines go up and down with Sundays thicker.
- 20 weekly celeration periods across the top.
- Counting lines go across, thicker are times 10.
- 6 times-ten counting cycles up the left. Count by ones in the bottom cycle, by tens in the next cycle, by hundreds in the third. Each cycle x10..
- Charting conventions are on the next page.

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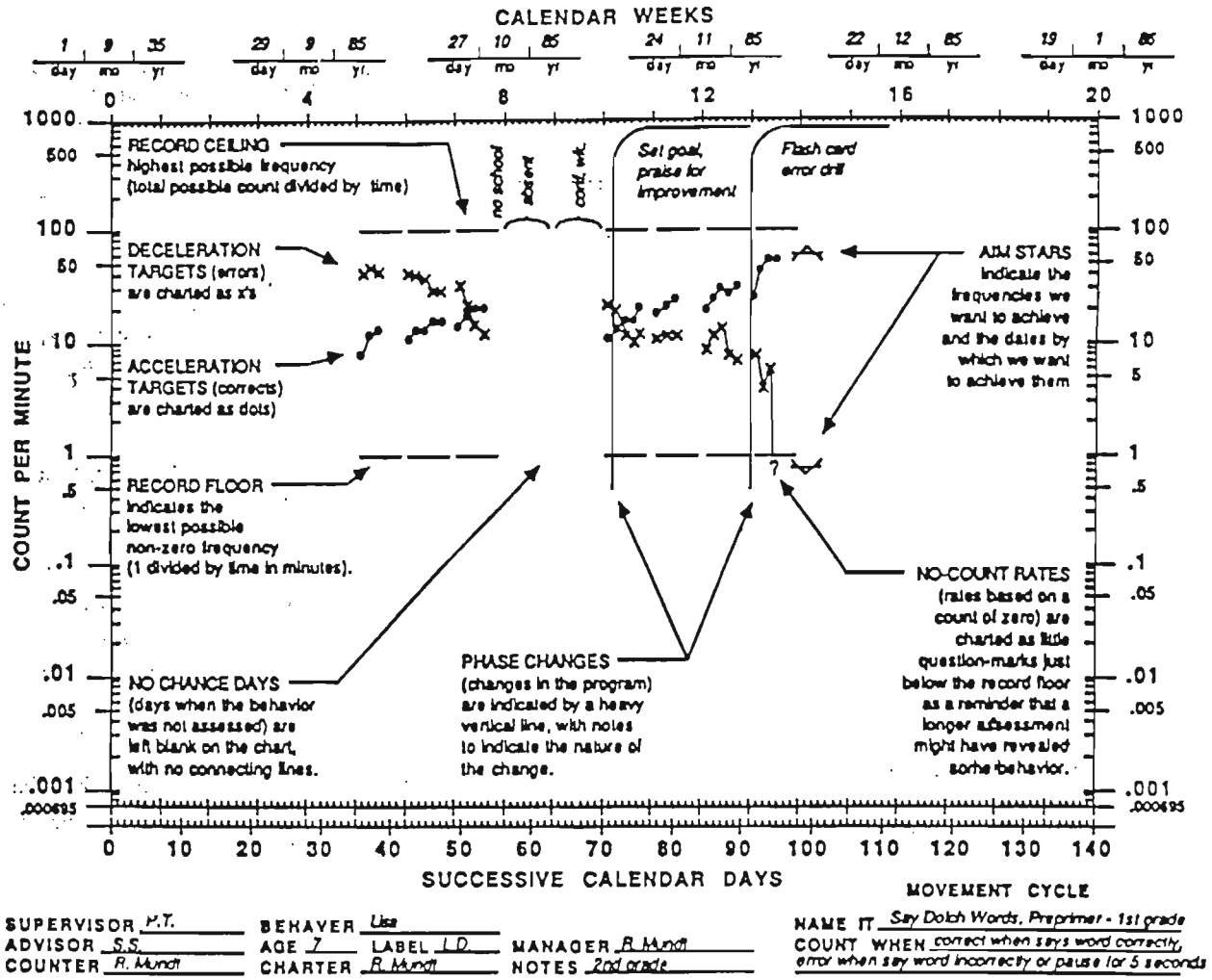
Notes and ideas:

## STANDARD CELERATION CHART AND CHARTING CONVENTIONS



## Daily Charting on Dpmin

- The next page spreads number correct, missed, one min. practice timings, and min. of study for each date. Write down your start time.
- Enter dates of the Sunday lines along top of chart.
- Chart hits (•) and misses (x) up from 1 pmin. line.
- Chart min. of study (*) down from 1 per min. line.
- Chart no. of practice timings (•) up from .001 line
- Write down your finish time. Subtract to get min. taken to chart. Divide 132 dots by your min. taken to get your charting frequency per min.

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Notes and ideas:

LEARNING PICTURE FREQUENCIES TO CHART ON DAILY CHART

| EPA 703 | ADVISOR: LINDSLEY - BEHAVER: ANN K. - COUNT: LEARNING PICTURE SAFMEDS | | | | |
|---|---|---|---|---|---|
| UNIV. OF KANSAS | | | | (VERSION 5 - 98 CARD DECK) | |
| DATE | DAY | NUMBER | NUMBER | MINUTES | (dot) NUMBER |
| | | CORRECT | SKIP OR MISS | OF STUDY | 1 MIN TIMINGS |
| | | (dot) | (x) | (dot) | (dot) |
| 3 JN 84 | S | Aim 60 | Aim 0 | | |
| | M | on 26 July | on 26 July | | |
| | T | 11 | 13 | 95 | 3 |
| | W | 17 | 11 | 50 | 4 |
| | R | 16 | 25 | 15 | 4 |
| | F | 15 | 9 | 10 | 5 |
| | S | 19 | 9 | 20 | 10 |
| 10 JN 84 | S | 25 | 4 | 10 | 2 |
| | M | 24 | 8 | 22 | 5 |
| | T | 21 | 18 | 10 | 6 |
| | W | 29 | 11 | 22 | 2 |
| | R | 20 | 5 | 15 | 3 |
| | F | 19 | 4 | 10 | 3 |
| | S | (WEEK END OFF) | | | |
| 17 JN 84 | S | " | | | |
| | M | 25 | 6 | 10 | 3 |
| | T | 26 | 2 | 20 | 5 |
| | W | 30 | 4 | 20 | 5 |
| | R | 25 | 5 | 22 | 7 |
| | F | 30 | 1 | 5 | 1 |
| | S | 35 | 3 | 45 | 10 |
| 24 JN 84 | S | 39 | 1 | 50 | 10 |
| | M | 37 | 0 | 20 | 5 |
| | T | 44 | 1 | 20 | 5 |
| | W | 41 | 0 | 20 | 5 |
| | R | 46 | 0 | 20 | 5 |
| | F | 44 | 0 | 20 | 5 |
| | S | 45 | 0 | 20 | 5 |
| 1 JL 84 | S | 46 | 0 | 20 | 5 |
| | M | 47 | 0 | 20 | 5 |
| | T | (4TH OF JULY HOLIDAY TRIP) | | | |
| | W | " | | | |
| | R | " | | | |
| | F | " | | | |
| | S | " | | | |
| 8 JL 84 | S | 39 | 1 | 20 | 5 |
| | M | 43 | 1 | 20 | 5 |
| | T | 50 | 0 | 5 | 2 |
| | W | 60 | 0 | 10 | 4 |
| | R | 70 | 2 | 10 | 3 |
| | F | 61 | 0 | 20 | 5 |
| | S | 62 | 0 | 20 | 5 |
| 15 JL 84 | S | | | | |

## Reading your chart of Ann's learning

- What was your charting frequency? ___ per min.
- The name of Ann's learning picture is _____.
- Ann's corrects accelerated at ____ per ____, and bounced at _____.
- Ann's misses decelerated at ____ per _____, and bounced at _____.
- What did her week-end trip do to corrects? ____Jump ____: ___Turn ___.
- What did her July 4th vacation do to corrects? ____Jump ____: ___Turn ___.

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Notes and ideas:

## Weekly SC Chart Wpwk

- **W** means weekly. **pwk** means count per week up the left. Form, language, and paper letters follow.
- Week lines up and down. Month lines thicker.
- The first week of a month is the first thin line to the right of the thick month separation line (the 5th week and celeration period line).
- In months with only 4 weeks, skip the 5th week and go on to the next month.
- 100 weeks with 20 monthly celeration periods across the top.

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Notes and ideas:

## Weekly Charting on Wpwk

- The next page spreads sales, barren calls, total calls, and percent of calls sold each week for a 5 to 7 person life-policy sales team.
- Note start time and enter dates of the weeks that start each month along chart top.
- Chart sales and barren calls each week for Mitchell Agency for March and April 1992
- Note finish time and minutes taken. Count the dots you dropped and calculate your charting frequency per minute.

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Notes and ideas:

MITCHELL AGENCY SALES TO CHART ON WEEKLY CHART

| MITCHELL INSURANCE AGENCY | | | NEW LIFE POLICIES SOLD BY LIFE TEAM | | |
|---|---|---|---|---|---|
| DATE | WEEK | SALES | BARREN CALLS | TOTAL CALLS | % SOLD |
| | | (dot) | (x) | | |
| 1 MR 92 | 1 | 3 | 10 | 13 | 23 |
| 8 MR 92 | 2 | 8 | 18 | 26 | 31 |
| 16 MR 92 | 3 | 6 | 26 | 32 | 19 |
| 22 MR 92 | 4 | 9 | 45 | 54 | 17 |
| 29 MR 92 | 5 | 12 | 42 | 66 | 18 |
| 5 AP 92 | 1 | 12 | 63 | 75 | 16 |
| 12 AP 92 | 2 | 18 | 121 | 139 | 13 |
| 19 AP 92 | 3 | 14 | 110 | 124 | 11 |
| 26 AP 92 | 4 | 19 | 135 | 154 | 12 |
| 3 MY 92 | | | | | |
| | 9 weeks in all | | | | |



File Code: WrdD25 / MitchInsSlstochrt

## Reading Your Weekly Chart of Insurance Sales and Calls

- What's your charting frequency? ____ pm.
- Compare your chart with Mitchell's chart of percent of calls sold on next page.
- Did Mitchell's percent chart mislead ?_____ How? _____
- Write the overall sales celeration ___per ___
- Write the barren calls celeration ____per ___
- By what multiplier are barren calls celerating compared to sales? _____

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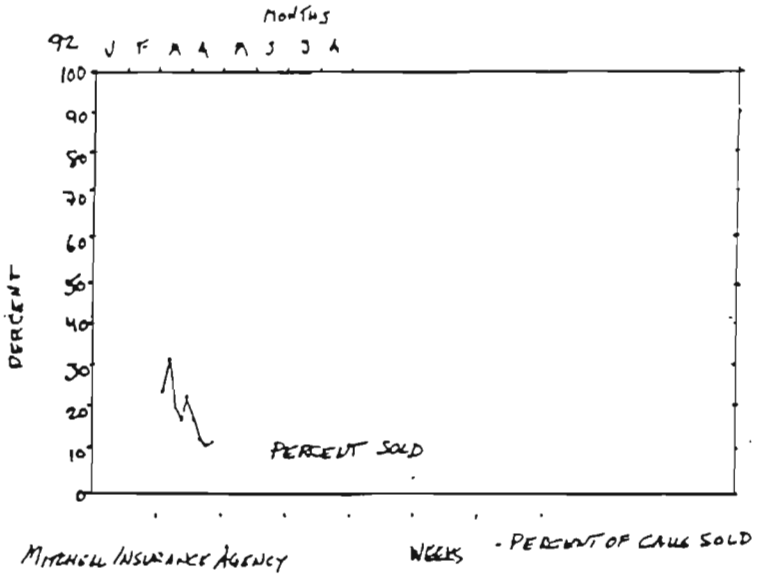
Notes and ideas:

# Mitchell Insurance Agency
# Chart of Percent of Calls Sold




Notes and ideas:

## Monthly SC Chart Mpmon

- **M** means monthly. **pmon** means count per month. Form, language, and paper letter codes follow.
- Month lines go up and down with 6 month lines thicker. 20 six-month celeration periods (10 years)
- Counting lines go across chart. 6 times-ten counting cycles up the left.
- For division and organization products.
- Reveals and projects seasonal sales rhythms.
- Helps cut inventory to next month's needs.

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Notes and ideas:

## Monthly Charting on Mpmon

- The next page spreads the new referrals to a private psychology clinic from yellow page ads for each month since January 1987.
- Note start time. Start years with 1987 at chart top.
- Chart referrals each month for CBD clinic from 1987 through 1993.
- Connect dots from Jan to Dec each year, but do not connect Dec to Jan to show rhythms.
- Note finish time, count the dots you dropped, and calculate your charting frequency per minute.

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Notes and ideas:

YELLOW PAGE REFERRALS PER MONTH TO A PSYCHOLOGY CLINIC

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | | | | | | | | | | | | | Yellow page Add details: |
| 1987 | 4 | 10 | 15 | 9 | 9 | 7 | 8 | 8 | 6 | 17 | 12 | 6 | 1/4 page |
| 1988 | 18 | 9 | 7 | 9 | 6 | 7 | 6 | 5 | 7 | 6 | 6 | 10 | 3/8 page |
| 1989 | 12 | 4 | 9 | 13 | 4 | 7 | 5 | 3 | 4 | 14 | 6 | 2 | 1/4 page |
| 1990 | 10 | 15 | 8 | 7 | 7 | 11 | 7 | 16 | 20 | 9 | 11 | 7 | 1/4 page plus visuals |
| 1991 | 18 | 20 | 18 | 25 | 16 | 12 | 8 | 17 | 23 | 23 | 15 | 12 | 1/4 page plus visuals plus red in column |
| 1992 | 19 | 8 | 18 | 11 | 10 | 17 | 10 | 9 | 13 | 12 | 12 | 9 | 1/4 page plus visuals |
| 1993 | 19 | 18 | 12 | 10 | 13 | 20 | 9 | 19 | 6 | 17 | 14 | 10 | 1/4 page plus visuals |
| 1994 | 20 | 23 | 18 | | | | | | | | | | |

CHARTING-11A

File Code Wd25/YelPge Ref/mo

## Reading your Monthly chart of CBD Referrals from YP Ads

- What's your charting frequency? _____ pm.
- Is there a clear seasonal rhythm? _____
- Did increasing ad size to 3/8 page have an effect on referrals? _____
- Did the visuals have an effect? _____
  What was it? _____
- Did the red color have an effect? _____
  What was it? _____
- Would you continue Visuals? ___Red? ___

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Notes and ideas:

## Yearly SC Chart Ypyr

- **Y** means yearly. **pyr** means count per year. Form, language and paper letter codes follow.
- 100 year lines go up and down with five-year lines thicker. 20 five-year celeration periods across top
- Counting lines go across chart. 6 times-ten counting cycles up the left.
- For company, industry, nation, and world counts.
- Find corporate growth stage (birth, adult, aged).
- Match product growth to competitor, customer, and consumer growth.

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Notes and ideas:

## Yearly Charting on Ypyr

- The next page spreads the number of U.S. made cigarettes sold in U.S.compared with those sold Overseas for 1960 to 1993.
- Note time and put 1950 at the top left of your chart to make room for sales projection lines.
- Chart the U.S. and Overseas sales per year.
- Note finish time and find time taken. Count the dots you dropped and calculate your charting frequency per minute.

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Notes and ideas:

## Yearly Counts to Chart: U.S. Made Cigarettes Sold

| Year | In U.S.A. | Overseas |
|---|---|---|
| 1960 | 480 billion | 25 billion |
| 1965 | 540 | 25 |
| 1970 | 540 | 50 |
| 1975 | 610 | 50 |
| 1980 | 640 | 80 |
| 1985 | 590 | 60 |
| 1990 | 520 | 190 |
| 1993 | 480 | 200 |

Source: The Tobacco Institute,
U.S. Department of Agriculture.

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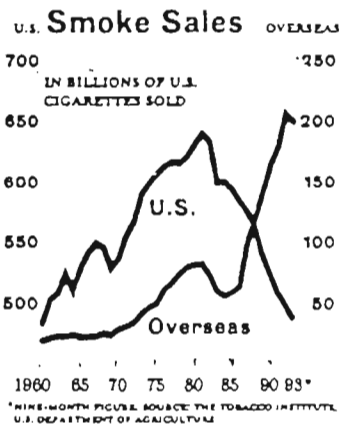
Notes and ideas:

# U.S. Made Cigarettes Sold In U.S.A. vs Overseas

*Cigarette companies are facing heat from Surgeon General Joycelyn Elders (below) for ad schemes such as the Joe Camel campaign. But while they may never see their products glorified again (see Marlene Dietrich above), they still showed how powerful they are during a recent demonstration.*




Notes and ideas:

# SeeHear/SayDo SCC Frequencies and Celerations

**Point x10 frequencies per minute, and per day**

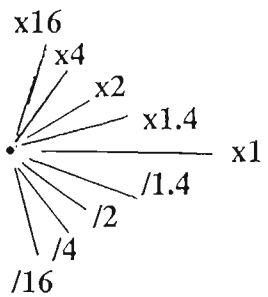
• All stand facing the left side wall of the room, holding out right arm palm extended. All look over their right shoulder and follow Coach pointing to and saying seven frequency x10 cycle lines on standard chart wall

| | | |
|---|---|---|
| 1000 per minute | ceiling meets wall | |
| 100 per minute | | |
| 10 per minute | | |
| 1 per minute | center of wall | 1000 per day |
| | | 100 per day |
| | | 10 per day |
| | floor meets wall | 1 per day |

• Coach corrects arm positions.
• After a few minutes a learner takes over coaching the group.
• And again, a second learner coaches group choral responding.
(Lindsley first used in October 1996.)

**Angle nine reference celerations with Forearm**

• All stand facing Coach in front of room, holding their left arm out straight from the shoulder. All follow Coach by rotating forearm and saying the following nine celeration angles (learning slopes), as coach calls out the number, for example: "times 1", "times 2", "divide 2", "times 4," etc.




• Coach corrects forearm angles, by saying, "Tom, up a little more. Good!"
• After a few minutes a learner takes over coaching the group.
• And again, a second learner coaches group choral responding.
(Lindsley first used in 1997. Steve Graf suggested angling the forearm.)

**Took 32 years to learn to teach in friendliest channel**

Most educators start teaching in the goal channel of the final performance. For charting they start with see/write. For 29 years we started with "Pencils up!" In 1994 we discovered that learners were more comfortable and learned faster starting in the friendlier channel of seehear/say (chart reading). Today, in day long standard charting workshops we don't pick up pencils until 1:00 PM!

By adding body position to seehear/say, making it seehear/saydo, we overcame more math fear and got more rapid understanding of chart standards. Indicating with our arms as we say teaches us faster than just saying the words. Incredible! Hard for an academic to believe!

## Reading Your Yearly Chart of U.S. Cigarette Sales

- What's your charting frequency? _____ pm.
- Compare your chart with Newsweek's March 21, 1994 chart on the next page.
- Did Newsweek mislead by mischarting?____ How? _____
- Write the overall US sales celeration.__ per __
- Write the most-recent US celeration. __ per __
- Write overall Overseas celeration. ____ per __
- Are US and OS sales independent? _____

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Notes and ideas:

## We Need More Published Mischarts

- I haven't many good examples of misleading daily and monthly charts in my files.
- If anyone has some recently published, highly topical misleading add-scale stretch-to-fill daily or monthly charts, please send them to me.
- It would be great if the charts were of national interest.
- Happy hunting, and good luck!

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Notes and ideas:

# SeeHear/Draw your own Standard Chart on Blank Paper

**Draw and label SCC cycle lines**

- Coach passes out a sheet of blank 8 1/2 x 11 inch paper to each learner, making sure each has also a pencil and eraser.
- Coach draws an empty frame on overhead projector or flip chart. If no overhead projector or flip chart, just say "draw a frame" and draw one in air. Group draws their own frames on blank white paper in landscape position.
- Coach says, "Draw a horizontal line across middle of frame."
- Coach asks, "What is that line?"
  Usually a learner says, "One per minute," because they have just pointed to the cycle lines on their standard chart wall .
- Coach says, "Correct! Write number per minute up the left margin and put number 1 at the left of that middle cycle line."
- Coach asks, "How many per day is that?
  Usually a learner says, "1,000 per day!"
- Coach says, "Correct! Write number per day up the right margin and put number 1000 to the right of that middle line."
- Coach says, "Divide top half in thirds with two horizintal lines," and does it. Group draws their two cycle lines.
- Coach asks, "What are their names?"
  A learner answers, "10 per minute and 100 per minute."
- Coach says, "Correct! Write 10 and 100 just to their left in the margin.
- Coach asks, "What's the name of the top horizontal line of the frame?"
  A Learner answers, "1000 per minute!"
- Coach says, "Correct! Label your top three lines.

...Group labels top three cycle lines.

- Coach says, "Divide bottom half into thirds by two horizontal lines. What are the names of the bottom three cycle lines?"
  Group says 1, 10, and 100 per day!"
- Coach says, "Correct! Label them in the right margin."

**Draw and label SCC period lines**

- Coach writes "Weeks" in top margin and "Days" in bottom margin, numbers left vertical frame edge 0 at top and 0 at bottom, and numbers right vertical frame edge 20 at top and 140 at bottom.
- Coach says, "Name top and bottom margins, and number frame verticals." Group names and numbers vertical period lines.
- Coach says, "Draw a center line down chart. How many weeks is it? Write 10 at top. How many days is it? Write 70 at bottom."
  Group draws and numbers center weekly period line.
- Coach says, "Draw in and number your 5 week and 15 week period lines." Group draws and numbers lines 5 and 15 at top and 35 and 105 at bottom.
- Coach says, "Draw remaining weekly period lines, four between 0 and 5, four between 5 and 10, four between 10 and 15, four between 15 and 20." Group draws remaining period (Sunday) lines.
- Coach says, "Number your 4, 8, 12, and 16 weeks at the top.
  Group numbers them.
- Coach says, "Number the 28, 56, 84, and 112 days at the bottom."
  Group completes chart by numbering alternate Sunday lines at the bottom.

**Took until August 1999 to Draw own chart**

- After drawing a chart in Hawaiian beach sand, I taught Piper Toyama, Parker School principal, to draw his own standard chart on blank paper. He valued his sketch, carefully placing it in a file folder as I left his office.

# SeeHear/Draw Add Counting Ticks Within a x10 Multiply Scale Cycle

Ogden Lindsley

Having beginners point to frequencies on a chart wall, elbow a change or celeration fan, and draw their own standard change chart on plain white paper helps them understand our chart.

Further understanding results when beginners draw their own counting ticks (add) on a single multiply cycle (x10). Here are the instructions for hand drawing the counting ticks.

Step 1 Draw a vertical line with small horizontal ticks across each end.

Step 2 Label the bottom tick <1>. Label the top tick <10>.

Step 3 Just a little less than halfway up the line draw a tick. Label it <3>.

Step 4 Using the edge of another piece of paper mark off a x3 distance from tick 1 to tick 3.
Slide this x3 paper distance up placing its bottom on tick 3.
At the x3 paper distance top draw a tick. It should be right under your tick 10.
Label it <9>.

Step 5 One third of the way up your line from tick 1 to tick 10 draw a tick.
Label it <2>.

Step 6 One third of the way down your line from tick 10 to tick 1 draw a tick.
Label it <5>.

Step 7 Using the edge of another piece of paper mark off a x2 distance from tick 1 to tick 2.
Slide this x2 paper distance placing its bottom on tick 2.
At the x2 paper distance top draw a tick. Label it <4>.

Step 8 Slide your paper x2 distance further up your line placing its bottom on top of tick 4.
At the x2 paper distance top draw a tick. It should be just under tick 9. Label it <8>.

Step 9 Place your paper x2 distance bottom on tick 3. At the x2 distance top draw a tick.
Label it <6>.

Step 10 A little more than halfway up from tick 6 to tick 8 draw a tick.
Label it tick <7>.

You now have drawn one times ten multiply cycle with ten labelled add counting ticks.
These distances between your add counting tick marks are not, of course, exact.

However, in drawing them you should have felt the surprising difference between multiply distances and the familiar add distances.

In the multiply world there is no zero!
3 is half the multiply way between 1 and 10!
The multiply distance from 1 to 2 is the same as from 5 to 10!
When you are at 2, you are one third of your multiply way to 10!

# SeeHear/SayPoint to Big Number on the Left* Rap

Michael Maloney's Direct Instruction inspired choral script helps teach the SCC add counting ticks. I include it for you who have had problems teaching our full six cycle Daily per minute Standard chart.

Coach starts at the one per minute line and points to each line up a projected chart transparency with a pencil or fine tipped pointer as learners point to the line on a paper chart in front of them as they call its number.

Coach lower case; LEARNER CHORUS UPPER CASE.

"My turn."
"Big number on the left that starts with one, tells what to count by and what to count from." (Spoken in rhythm. Coach sways body and nods head or taps overhead projector to keep rhythmic beat at accented points.)
"Your turn."
"BIG NUMBER ON THE LEFT THAT STARTS WITH ONE,
TELLS WHAT TO COUNT BY AND WHAT TO COUNT FROM."
Repeat until entire chorus responds loudly, together, and in rhythm.
"Your turn."
"BIG NUMBER ON THE LEFT THAT STARTS WITH ONE,
TELLS WHAT TO COUNT BY AND WHAT TO COUNT FROM."

Coach points to number one at left of one per minute line.
"What's the number?" "1."
"What do you count by?" "1."
"What do you count from?" "1."
"Point and count!"
"1. 2, 3, 4, , 6, 7. 9, 9, 10!"

What's the number?" "10."
What do you count by?" "10."
What do you count from?" "10."
"Point and count!"
10, 20, 30, 40. 50. 60. 70, 80. 90. 100!"

What's the number?" "100."
What do you count by?" "100."
What do you count from?" "100."
"Point and count!"
100, 200, 300, 400, .500, 600, 700, 800, 900, 1000!"

The coach points to each line on a projected chart transparency as learners call the number and point to the line on their paper chart ith their pencil.

This is a multiply scale with add counting lines between the cycles. It is also found on the A and B scales of the now obsolete slide rule. The A and B scales have two such multiply cycles. The Standard Celeration Chart scale up the left is like three slide rule A scales placed end to end. That is why Gunter and his line are SC chart precursors and not Napier with his logarithmic tables and formulas.

Lindsley, O. R. (1994). Gunter's line - standard celeration chart ancestor, not Napier's logs or bones. Journal of Precision Teaching, 12(1), 97-104.

* Adapted, simplified, and set to rhythm and rhyme from Michael Maloney's Direct Instruction chart teaching script by Ogden Lindsley in 1986.

Maloney, M. (1982). Teaching the daily Standard Behavior Chart: A Direct Instruction approximation. Journal of Precision Teaching, 2(4). 11-30.

# Two Time Tested Precision Teaching Songs

---

**Are You Charting? 1973**

Tune of "FrereJacques."
Words by Henry S. Pennypacker
Precision Teaching of Florida workshops.

Are you charting? Are you charting?
Yes we are! Yes we are!
Chart a little movement. Look at the improvement!
Every day, In every way.

Are you changing? Are you changing?
Yes I am! Yes I am!
Changing my procedures. Helping little creatures,
Learn to grow. See them grow!

Are we teaching? Are we teaching?
Yes we are! Yes we are!
Teaching with Precision, making each decision,
with our charts. From our hearts!
From our hearts!



---

**Care, care, care enough 1977**

Tune of "Row, row, row your boat."
Words by Henry S. Pennypacker,
Precision Teaching of Florida Workshop 1977

Care, care, care enough
Care enough to chart
Uniquely styled for every child
We're teaching from the heart

Care, care, care enough
Care enough to chart
Love and growth, we give them both
When we care enough to chart

Care, care, care enough
Care enough to chart
Our love will fill all Jacksonville
If we care enough to chart



---

# Precision Teaching and Standard Charting Resources

**Articles and chapters**

Lindsley, O. R. (1992). Precision Teaching: discoveries and effects. Journal of Applied Behavior Analysis, 25, 51-57.

Lindsley, O. R. (1997). Performance is easy to monitor and hard to measure. In R. Kaufman, S. Thiagarajan, & P. MacGillis (Eds.). The guidebook for performance improvement: Working with individuals and organizations. (pp. 519-559). San Franciso, CA: Pfeiffer, Jossey-Bass.

Lindsley, O. R. (1997). Precise instructional design.: Guidelines from Precision Teaching. In C. R. Dills & A J. Romiszowski (Eds), Instructional development paradigms (pp. 537-554). Englewood Cliffs, NJ: Educational Technology Publications.

Lindsley, O. R. (1999). From training evaluation to performance tracking. Chapter 11. In H. Stolovitch & E. Keeps (Eds.). The handbook of human performance technology, edition 2. (pp. 210-236). San Francisco, CA: Pfeiffer, Jossey-Bass.

**Recent books**

Beck, R., Conrad, D., & Anderson, P. (1995). Basic skillbuilders handbook. Longmont, CO: Sopris West.

Maloney, M. (1998). Teach your children well: A solution to some of North America's educational problems. Cambridge, MA: Cambridge Center for Behavioral Studies.

**Materials**

| | |
|---|---|
| Behavior Research Company | www.behaviorresearchco.com<br>Fax: 913-362-5900 |
| Sopris West | www.sopriswest.com |

**School websites**

| | |
|---|---|
| Ben Bronz Academy, West Hartford, CT | www.tli.com |
| Judge Rotenberg Center, Canton , MA | www.judgerc.org |
| Morningside Academy, Seattle, WA | www.morningsideinfo.com |
| Tobinworld, Glendale, CA | www.tobinworld.org |
| Quinte Learning Center, Ontario | www.qlced.com |

**Business (Fluency)**

| | |
|---|---|
| Binder-Riha, Inc. | www.binder-riha.com |
| Celeration Technologies, Inc. | http://members.home.net/joeparsons/ |

**Listserv**

Standard Celeration listserv. 145 members. 1 to 5 messages a day.
Excellent quick answers to beginner's questions. Join at www.celeration.org.

**Website**

Standard Celeration Society website www.celeration.org

**Society and Journal**

Standard Celeration Society and Journal of Precision Teaching at www.celeration.org

| | | |
|---|---|---|
| Sustaining member | $100 per year | Receive 2 Journal subscriptions |
| Member | $50 per year | Receive 1 Journal subscription |
| Student (show FT student ID) | $25 per year | Receive 1 Journal subscription |

Busines meeting held at the Association for Behaviour Analysis annual convention.
Presentations at the Annual International Precision Teaching Conference.
Local monthly chart shares sponsored by local chapters.