



Individual Growth & Development Indicators

Their Role in the CRtIEC Measurement
Architecture



Outline

- New IGDIs
- IGDIs as screening measures
 - Normative Approach
 1. Defining risk groups
 2. Setting cut points
 3. Tier One: percent of students below cut point
 - Criterion-Referenced Approach
 1. Defining risk groups
 2. Setting cut points
- IGDIs as progress monitoring measures



New cadre of IGDIs

- More comprehensively cover domain of language and literacy development in preschool children.
 - Alphabet Knowledge
 - Comprehension
 - Additional components of Oral Language and Phonological Awareness
- We have past evidence of utility as screening measures.
- Less evidence about their use for progress monitoring.



New cadre of IGDIs

□ Old IGDIs

- Picture Naming
- Rhyming
- Alliteration

□ New IGDIs

- Picture Naming
- Definitional Vocabulary
- Which One Doesn't Belong
- Letter Orientation
- Sound Identification
- Rhyming
- Alliteration
- Sound Blending



IGDI Research and Development Process

- Extensive Literature Reviews
- Robust analyses of component skills for each early literacy area: Alphabetic Principle, Oral Language, Phonemic Awareness and Comprehension
- Measure Design and Pilot implementation
- Phase 1 trials
- Evaluate the measures to determine best candidates
- Refinement
- Phase 2 trials



Letter Orientation

Point to the letter (1 min)





Sound Identification

Point to the letter that makes the /t/ sound

H

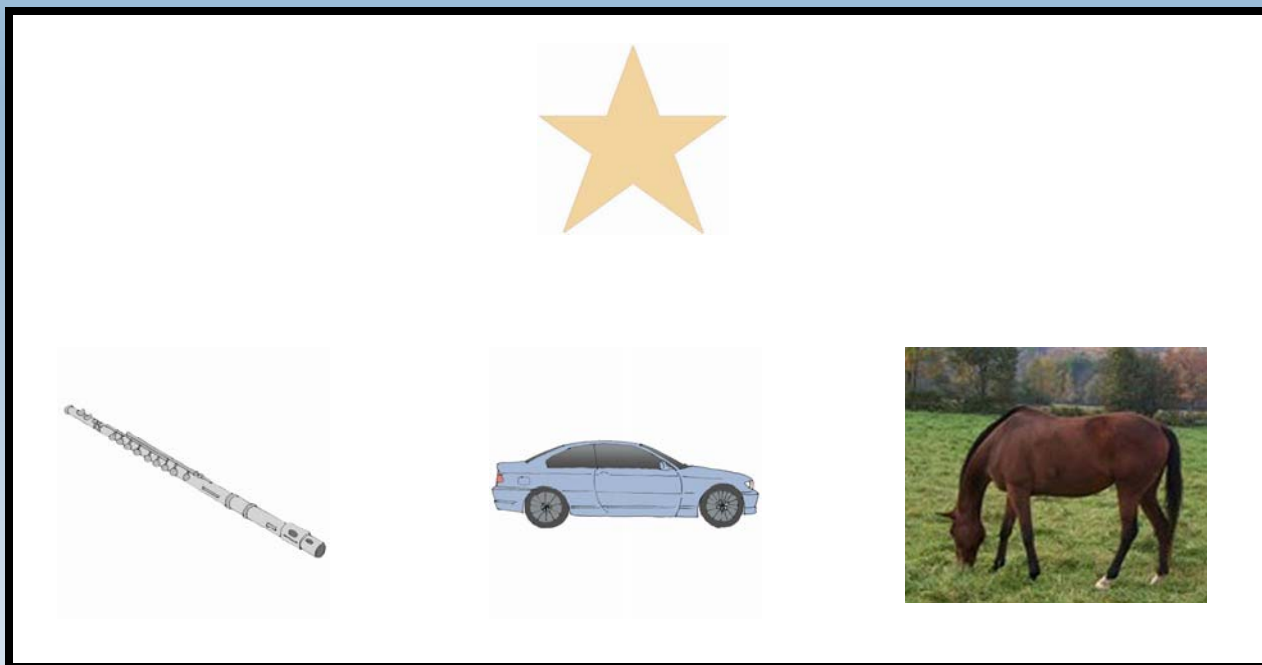
F

T



Rhyming

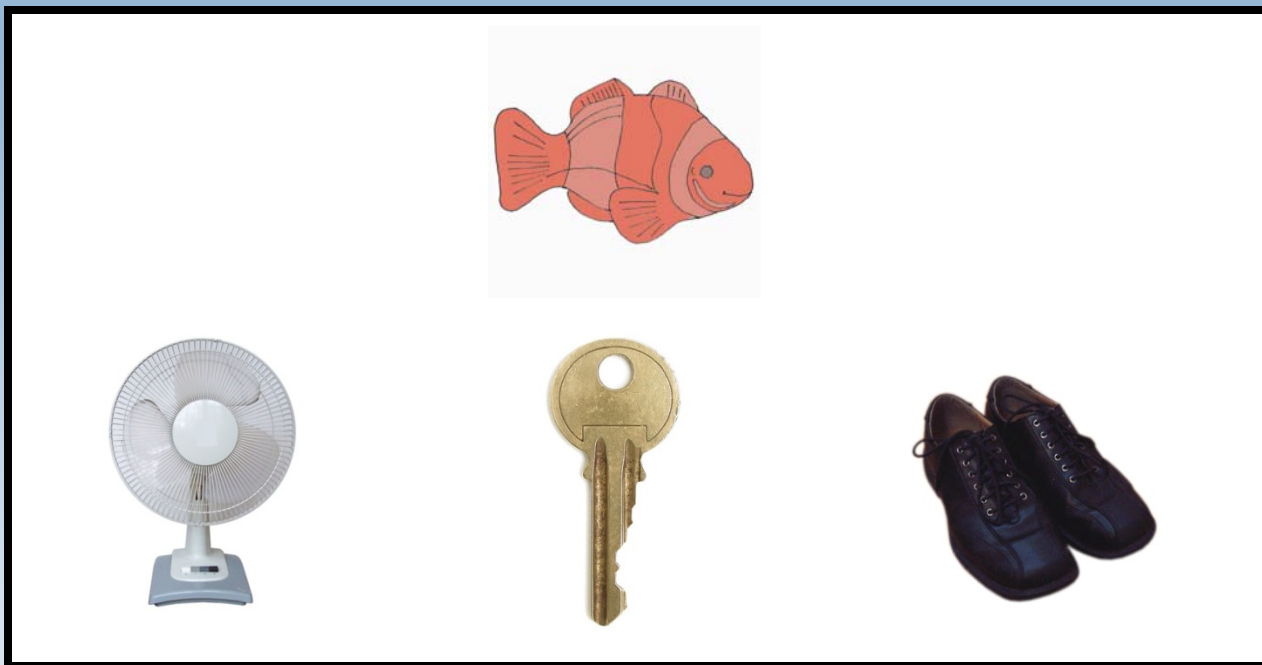
Find the picture that rhymes with target picture (2 min)





Alliteration

Find the picture that starts with the same sound as target (2 min)





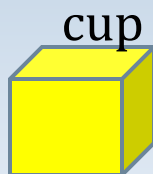
Sound Blending

- Blending word chunks: includes both two syllable words and the beginning and ending sounds of one syllable words; 2 minutes

I'm going to say some words in a funny way. See if you can say them the real way.

For example, I can say *cow* (tap first block, 1 sec pause) *boy* (tap second block), that's the funny way. *Cowboy* (push blocks together) is the real way.

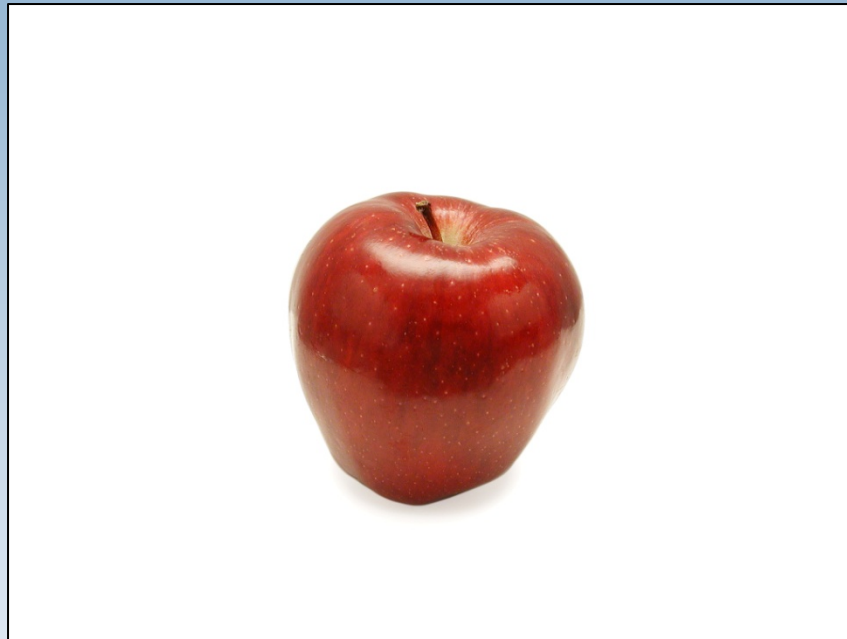
Here's another one. *A* (tap first block, 1 second pause) *ple* (tap second block) is a funny way. *Apple* (push blocks together) is the real way.





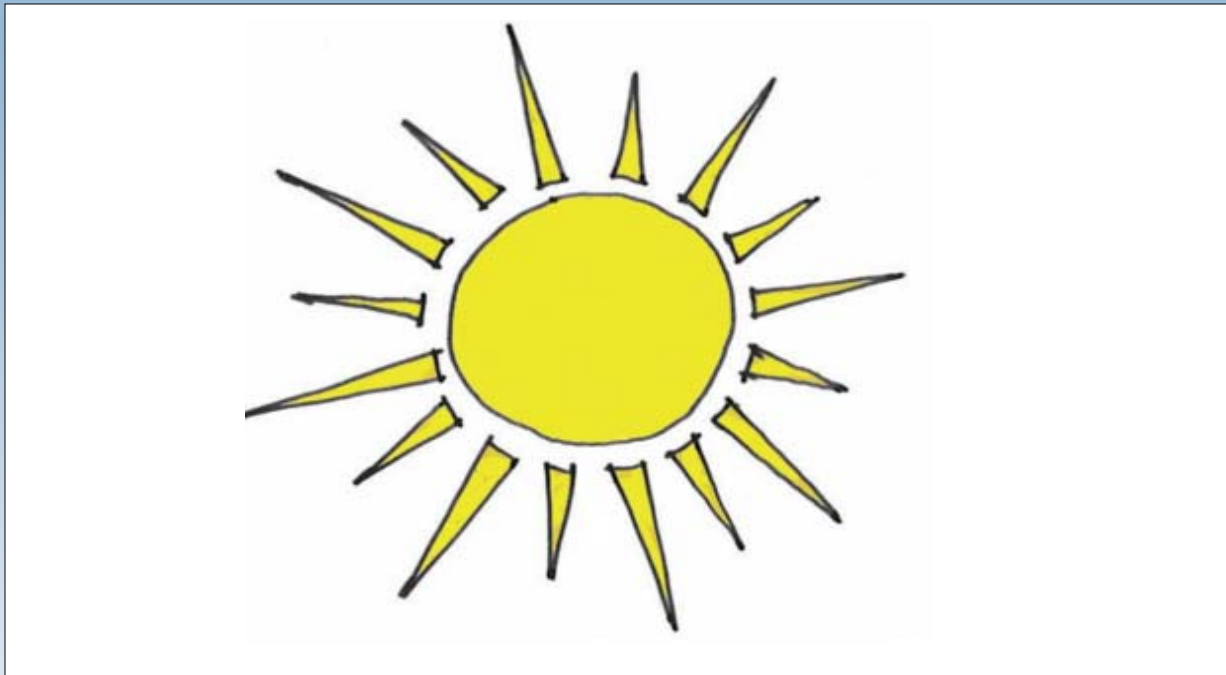
Picture Naming

- Child says the name of the picture (1 min)



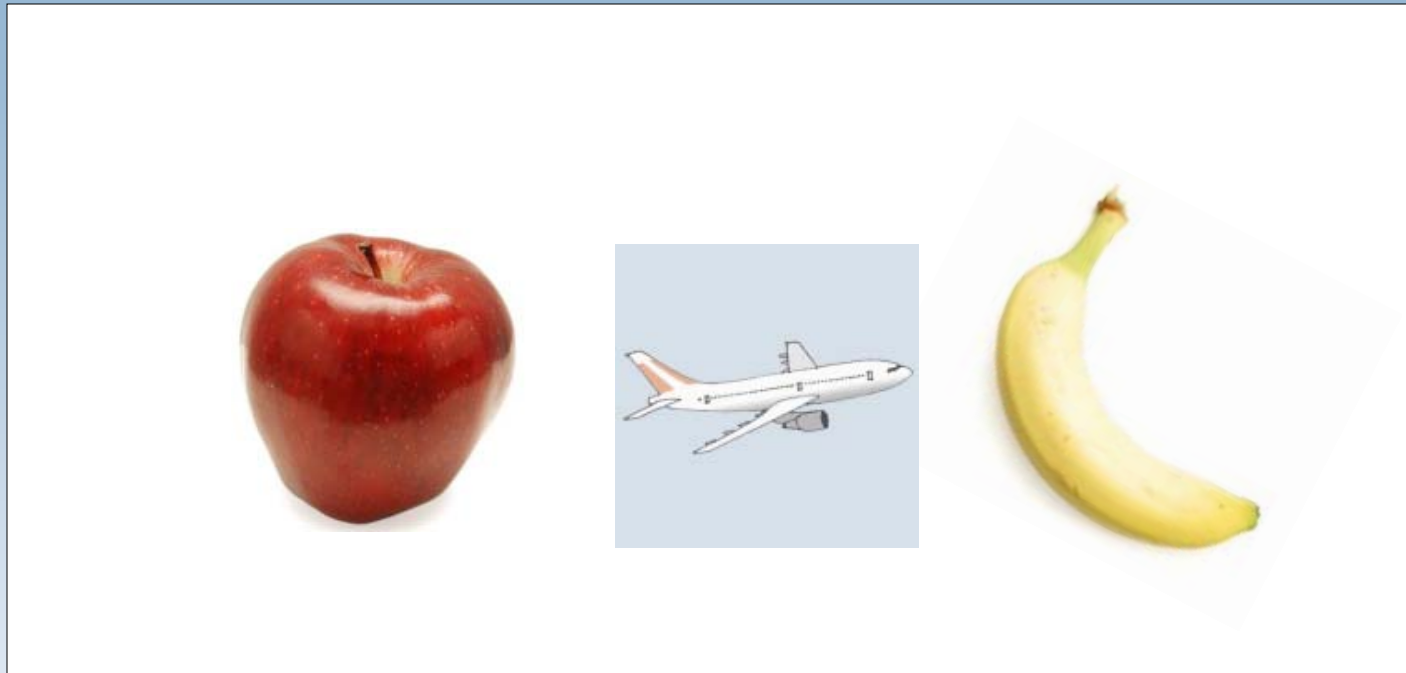
Definitional Vocabulary

- Child looks at a picture and answers a question about the object in the picture (1 min)



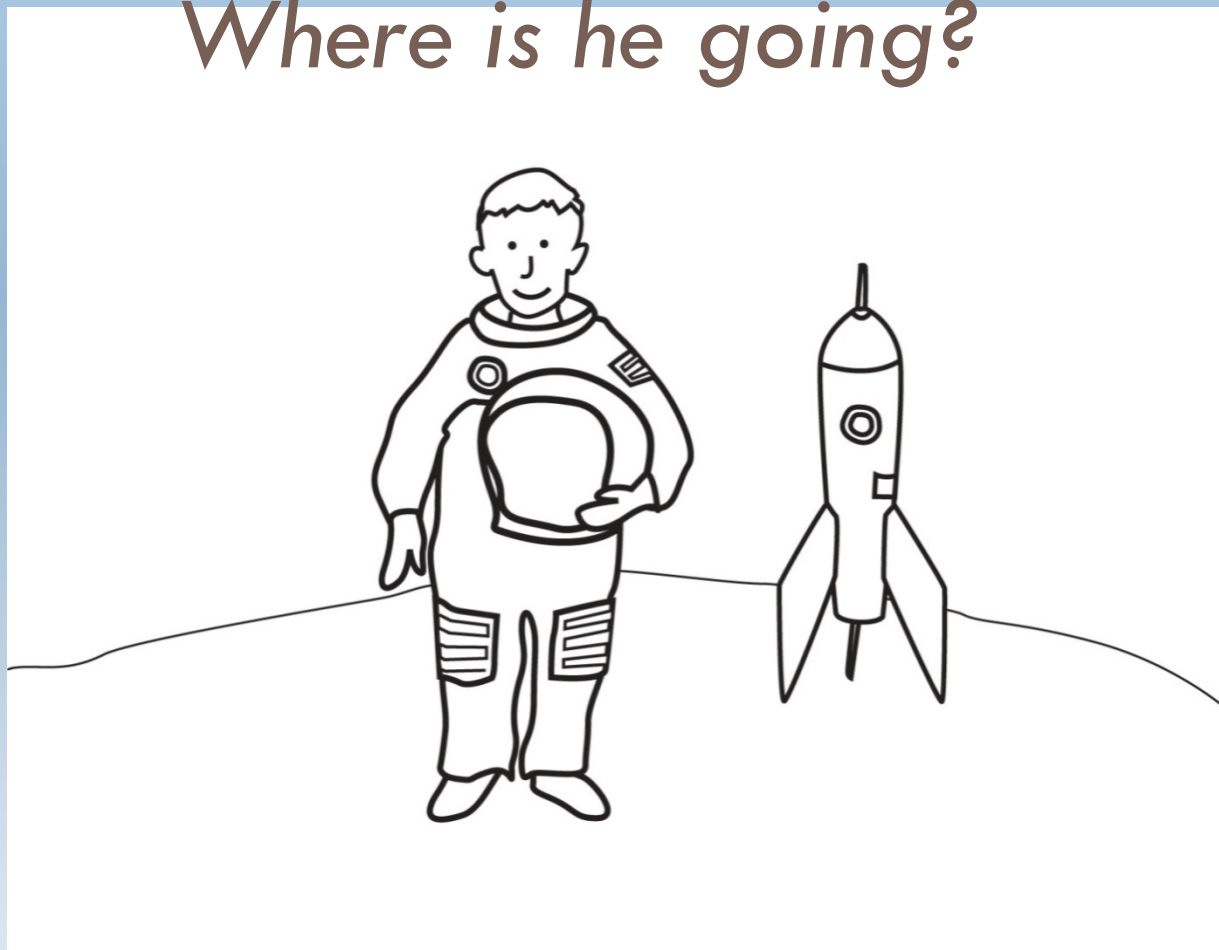
Which One Doesn't Belong?

- Child points to the picture that is different from the other pictures (2 min)



Picture Comprehension

Where is he going?

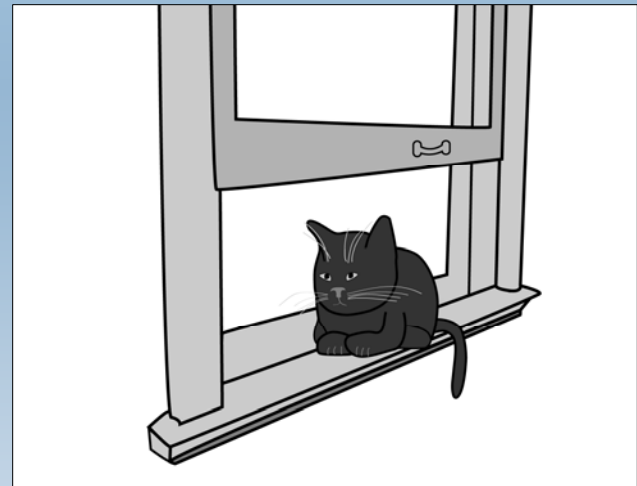
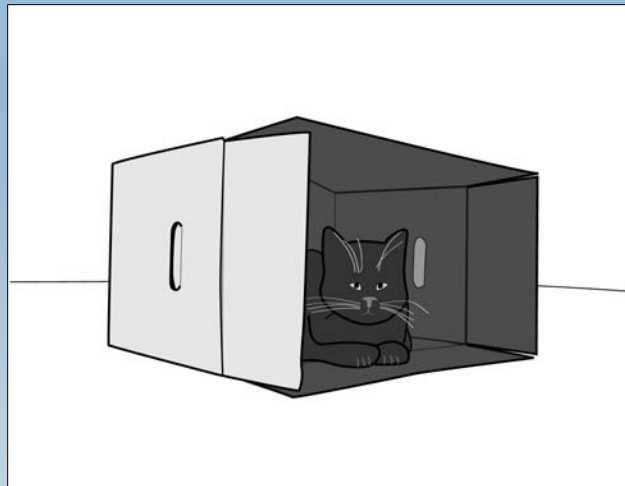
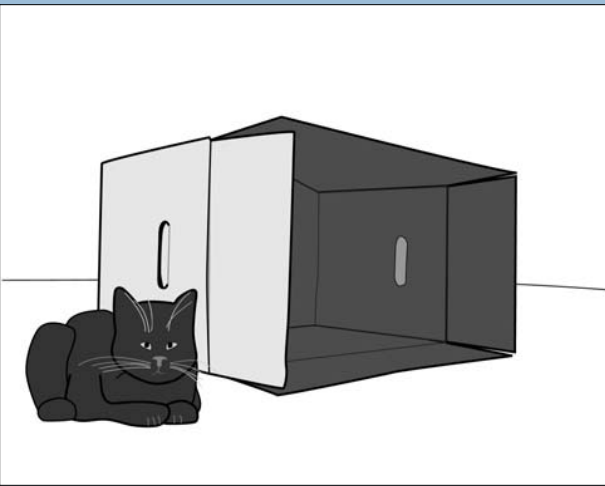


Sequencing





Sentence Comprehension





IGDIs role in CRtIEC's Measurement Architecture

- Screening/ Identification
 - To identify whether individual children meet standard(s) for Tier 2 or Tier 3 services in one or more domains

- Progress Monitoring
 - To assess whether individual children are demonstrating sufficient growth in the skill area of concern.



IGDIs and the Tier One Study

- IGDIs data collected on ~ 726 children.
 - One wave completed. Two more underway.
- IGDIs utility as screening measures: two approaches
 - Norm-referenced
 - Criterion-referenced



Norm-Referenced Approach

- ❑ Define risk groups based on child score on a “gold-standard” norm-referenced assessment.
- ❑ Guiding questions
 1. Are there significant mean differences on IGDl scores when groups are defined by GRTR cut points?
 2. What are cut scores on IGDls when risk levels are defined by GRTR scores?



Defining Risk Groups

- GRTR secondary validation study (Whitehurst, 2001):
 - Successful 2nd grade readers mean score of 25.86 correct on the Developing Skills Checklist (DSC; CTB/McGraw-Hill, 1990).
 - Unsuccessful 2nd grade readers mean score of 17.77 correct on the DSC.
 - Linear regression analysis determined:
 1. GRTR score of 11.14 predicted for children with DSC of 25.86.
 - successful 2nd grade readers group
 2. GRTR score of 8.56 is predicted for children with a DSC score of 17.77.
 - unsuccessful readers group
- Use GRTR scores of 8 and 11 as cut points

High Risk ≤ 8

Potential Risk = 9, 10

No Risk ≥ 11



IGDI Scores per Risk Level

- Significant Mean Difference Across All Three “Risk” Categories
 - Picture Naming
 - Definitional Vocabulary
 - Letter Orientation
- Significant mean difference between “no risk” and both “high” and “potential” risk groups.
 - Rhyming
 - Alliteration
 - Sound Identification
 - Which One Doesn’t Belong
 - Sound Blending



Different Risk Definition: Similar Pattern

- Criterion Measures: PPVT; CELF; TOPEL phonological awareness & print knowledge sub tests
 - Risk category defined by standard deviation from mean
 1. $SS \leq 2 \text{ sd}$ is high risk
 2. $SS \geq 1 \text{ sd}$ is no risk
 3. SS between these two points = potential risk

- PPVT: same pattern as GRTR
 - Letter Orientation IGDI only exception



Do IGDIs discriminate between risk groups?

- Yes!
- Can inform screening decisions
 - no risk vs. some level of risk
- Within CRtIEC's Rtl model:
 - IGDIs can identify children who may need more than Tier One services.



IGDI Cut Points

- ❑ Cut score: Mean IGDI score for “potential risk” group
 - ❑ Picture Naming 13
 - ❑ Letter Orientation 8
 - ❑ Def Vocabulary 8
 - ❑ Rhyming 3
 - ❑ Alliteration 3
 - ❑ Which One Doesn't Belong 8
 - ❑ Sound Identification 4
 - ❑ Sound Blending 2



Revisit Overarching Question #1

- *When using a norm-referenced approach, what proportion of children will fail to meet cut points on screening measures in early literacy and language and thus be identified for Tier 2 /Tier 3 level of early literacy and language intervention?*
- Rhyming: 43%
- Definitional Vocabulary: 42%
- Sound Identification: 42%
- Alliteration: 42%
- Which One Doesn't Belong: 41%
- Sound Blending: 39%
- Letter Orientation: 42%
- Picture Naming: 43%



Another method for setting cut scores: Contrasting Groups Design

Need to start with Performance (Tier) Level Descriptors (PLDs)

PLDs are:

- Elaborations of knowledge, skills or attributes of individuals at each tier level.
- Criterion-referenced approach



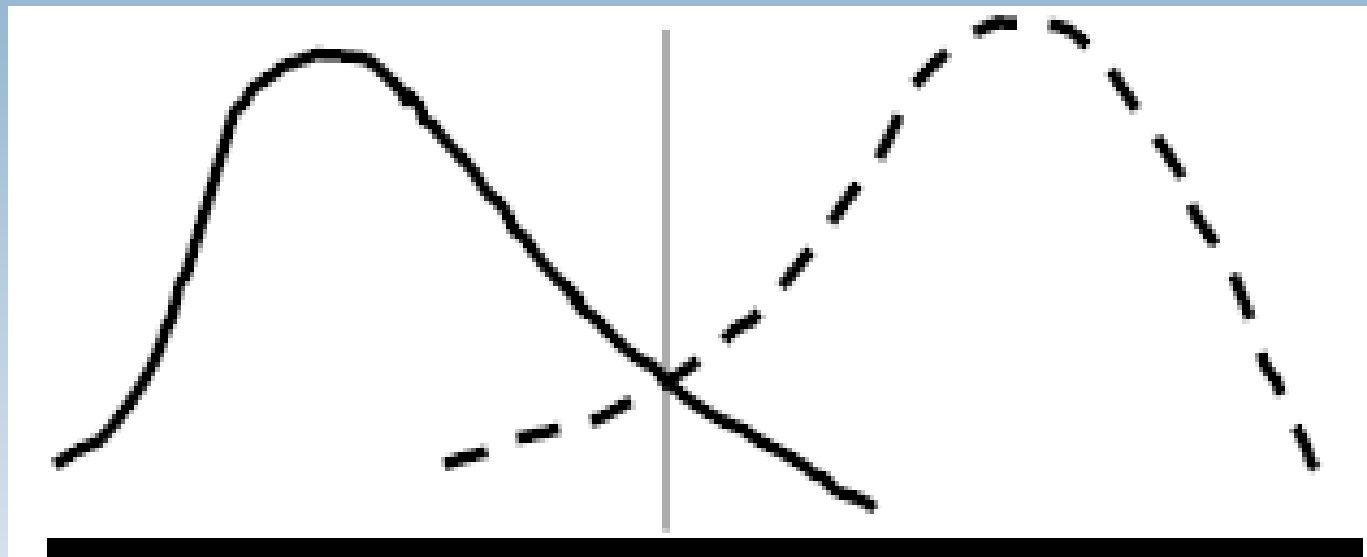
Contrasting Groups Design

1. Using the PLDs as a guide, teachers place children in a performance level.
 - Not provided with assessment information
2. Children are assessed on IGDIs. Distributions of children's performance on each measure compared.
3. Estimate the two distributions to identify the point that discriminates between the groups.



Setting the cut score

- Intersection of the two distributions
- Midpoint between two means or two modes





What about progress monitoring?

- Starting 2nd wave of IGDI data collection currently.
 - MN collected one additional wave
 - Will be able to model growth for entire sample by the end of this academic year
- Preliminary analyses show significant growth across measures from time 1 to time 2
 - Mean difference varied from 1.2 to 3.9



Questions we'd like to explore later this morning:

- What are the best ways to capture quality and quantity of Tier 1 instruction?
- What's the best way to set cut points to differentiate tiers of risk for early literacy?
- On what critical dimensions of quality and quantity should we differentiate instruction
 - between Tier 1 and Tier 2?
 - between Tier 2 and Tier 3?