

ENGAGING PHYSICAL EDUCATORS IN ASSESSING FITNESS DIFFERENTLY 2.0

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FITNESS ASSESSMENT TOOLS FOR PHYSICAL EDUCATORS

- **WHAT DO WE WANT TO ASSESS?**
- **OPTIONS FOR WHAT WE WANT TO ASSESS**
- **TIME COMMITMENT**
- **WHO ASSESSES?**
- **ARE THE ASSESSMENTS WE PICKED WORTH IT?**

BACKGROUND

- **FITNESSGRAM OPTIONS**
- **OTHER FITNESS ASSESSMENT OPPORTUNITIES**
- **KNOWING WHERE DEFICIENCIES ARE IN GROSS AND FINE MOTOR SKILLS**
- **BEING ABLE TO DETERMINE MOTOR STRENGTH AND NEUROMUSCULAR CONTROL DIFFERENCES**
- **BEING ABLE TO DISCRIMINATE BETWEEN SPEED, BALANCE, COORDINATION, AND LATERAL MOVEMENTS IMPORTANT FOR INJURY PREVENTION**

OBJECTIVES

- IDENTIFY AT LEAST TWO REASONS WHY ASSESSMENTS FOR MOTOR COMPETENCE, BODY COMPOSITION, AND LIMB IMBALANCES ARE ESSENTIAL FOR PHYSICAL EDUCATORS TO USE WITH ALL LEVELS OF STUDENTS.
- RECALL THREE CRITERIA NEEDED TO ACQUIRE EQUIPMENT NECESSARY TO ASSESS THESE STUDENT SKILLS.
- PRACTICE BALANCE, CROSS LIMB MOVEMENTS, AND BODY FAT ASSESSMENT TECHNIQUES WITH ACCURACY.

BODY FAT ASSESSMENTS

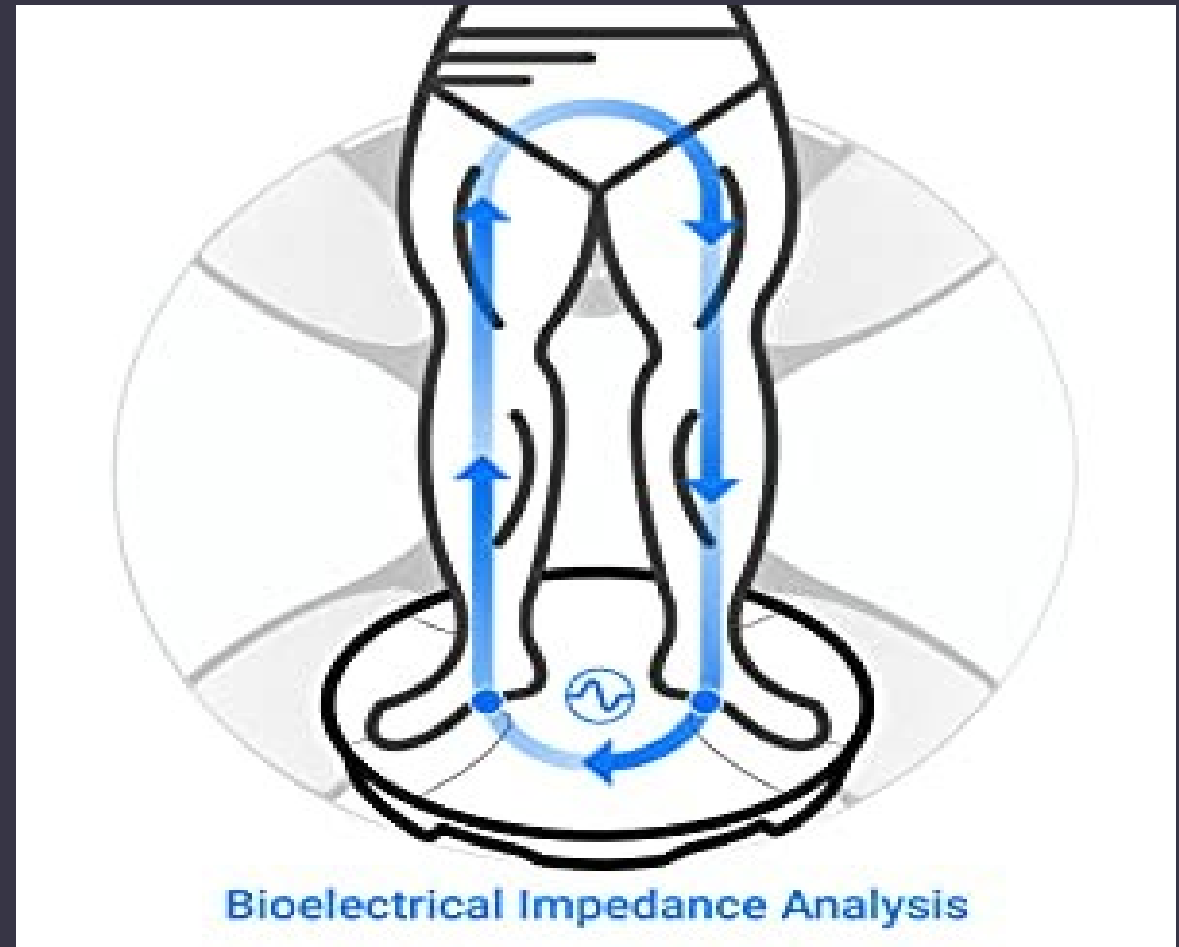
BODY MASS INDEX COMPARED TO OTHER ASSESSMENT TOOLS OF BODY FAT

- **BMI**
 - Calculated as a ratio of height and weight
 - Doesn't measure body fat directly, but correlated to other direct measures
 - Uses normative data to determine underweight, healthy weight, overweight, or obese percentile scores
- **Skin folds**
 - Cost efficient
 - Time consuming and high error rate
- **Waist circumference**
 - Cost efficient and relatively low error rate
 - Not always a true indicator
- **Dual-energy X-ray absorptiometry (DXA)**
 - Gold standard
 - Expensive and impractical with large population
- **Bio-electrical impedance analysis (BIA)**
 - Cost efficient and moderate to strong correlation with DEXA
 - Consistent measures between participants



BIOELECTRICAL IMPEDANCE ANALYSIS (BIA)

- Determines body fat and fat free mass
- Valid and reliable for children
- Categorize student status based on % BF
 - Underweight
 - Healthy
 - Overweight
 - Obese
- Should be fasted
 - Impossible with this population



BIA PROTOCOL

- Tanita BF 2000
- Students stand on scale with shoes off
- Each measurement takes about 10-15 seconds
- Blinded results from students
- Data uploaded to computer via Bluetooth
- Valid and reliable for K-5 students



BIA PREPARATION STEPS

1. Where will the assessment take place?
2. Needs prior to the assessment:
 1. Identify the wall to measure height/measuring tape secured to wall
 2. Birthdate for each child prior to using BIA software
 3. A computer with the software loaded
 4. Wipes to clean the scale surface between each student
3. Who will do the assessments?
4. Sheet to record info
5. How to rotate

BIA MEASURE INSTRUCTIONS

Step 1

- Measure height (in inches)
- Create user profile

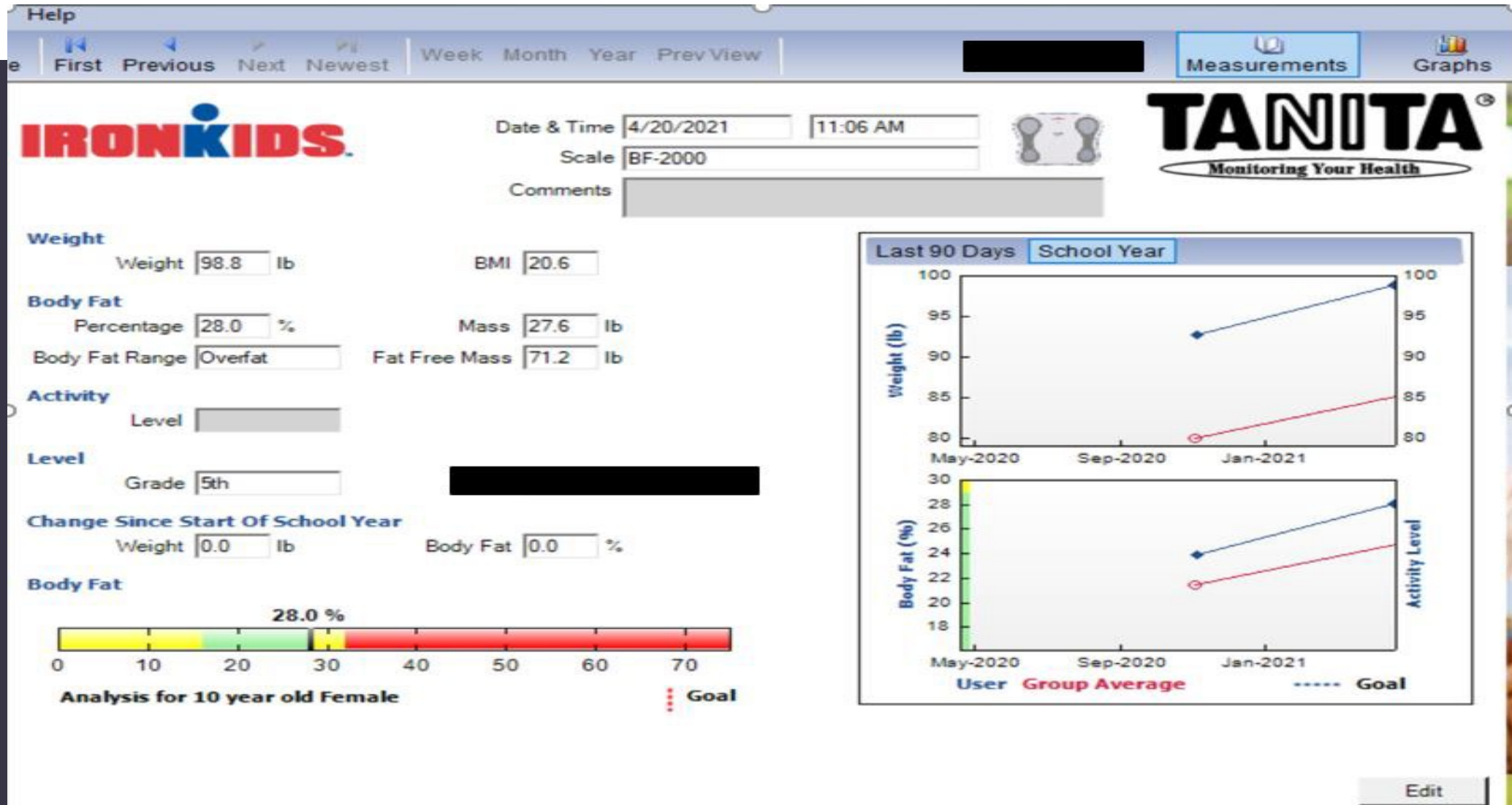
The screenshot shows the 'IronKids by Tanita' software interface. A 'New User #1's User Profile' dialog box is open, allowing for the creation of a new user profile. The dialog has two tabs: 'Personal' and 'Goals'. The 'Personal' tab is active, showing fields for Name (Title, First Middle Last), ID, Grade, Class, Birthday, Gender, Height, Stride Length, Units, Heart Rate Monitor S/N, Tanita Key S/N, My.Tanita Username, My.Tanita Password, and Comments. There is also a checkbox for 'Measure weight only when available'. The background shows the main software window with a menu bar (File, Edit, Users, Classes, Help) and a toolbar with buttons for 'New Measurement', 'User Profile', 'First', 'Previous', 'Measurements', and 'Graphs'. The main area displays 'No User Selected'.

Step 2

- Students remove socks and shoes
- Select "New Measurement"
- Scale will flash green light
- Student steps on metal plates
- Scale will beep twice, green light will disappear

The screenshot shows the 'IronKids by Tanita' software interface with the 'New Measurement' dialog box open. A red arrow points to the 'New Measurement' button in the toolbar. The dialog box has a menu bar (File, Edit, Users, Classes) and a toolbar with buttons for 'New Measurement' and 'User Profile'. The main area displays a table with columns 'Name' and 'ID'. The table contains one row with 'Test' and '1234'. Below the table are filters for Grade, Class, Gender, and a Find field. The status bar at the bottom indicates 'Group contains 1 of 0'.

BIA RESULTS



MOTOR COORDINATION ASSESSMENTS



WHY IS MOTOR COORDINATION IMPORTANT???

- For the past 10 years, falls have been the leading cause of nonfatal injuries for children under the age of 15 years old.
- Children are more prone to fall injuries due to motor coordination (MC) deficits.
- Encouraging more physical activity / play opportunities into a child's life.
- Gross motor competence is the key to identifying a child's dynamic postural balance abilities.

MOTOR COORDINATION ASSESSMENT TOOLS

- **Peabody Developmental Motor Scales-2 (PDMS)**
 - Developmental Coordination Disorder (DCD; Dyspraxia)
- **The Movement Assessment Battery for Children (M-ABC)**
 - Development level of daily life movement skills (manual dexterity, ball skills, balance)
- **Test of Gross Motor Development 2 (TGMD-2)**
 - Gross movement performance of movement skills
- **Motor Proficiency Test for Children (4-6 years of age; MOT₄₋₆)**
 - Early detection of fine and gross movement skills with 4–6-year-olds (rooted in KTK principles)
- **Körperkoordinationstest für Kinder (KTK)**
 - Diagnose children with movement difficulties including balance, rhythm, strength, laterality and agility

KTK ASSESSMENT – WHY USE THIS TOOL?

- To assess gross motor function of children and adolescents (5 and 14 years).
- A valid and reliable assessment tool in other countries.
- Determine proficiency of physical fitness skills in typical and atypical children.
- They love doing the assessments!



KTK ASSESSMENT



The *Körperkoordinationstest für Kinder* (KTK) has four skill components to assess balance, rhythm, strength, laterality, speed, and agility.

- 1st component: lateral jump for 15 seconds (LJ)
- 2nd component: moving sideways on wooden boards for 20 seconds (MS)
- 3rd component: single leg hopping (R/L) for height over a 5cm ht foam obstacle, continuing to add more foam pads up to 60 cm for each successful attempt (SH)
- 4th component: walking backwards on three balance beams - each decreasing in width from 6.0 cm to 4.5 cm to 3.0 cm (WB).

VERTICAL MOVEMENT SUBTESTS

Balance Beams (WB) Subtest & Single Leg Hopping (SH) Subtest



LATERAL MOVEMENT SUBTEST

Lateral Jumping (LJ) Subtest
&
Sideways Step (SS) Subtest

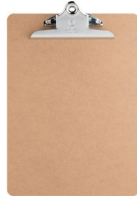


KTK SET UP



- Adherence meeting should be conducted prior to evaluation day.
- All KTK subtest will take place inside the gym.
- The administration of KTK needs at least two evaluators to evaluate 20-35 students per class.
- Takes two 45-minute P.E. classes to complete.
- Two of the four subtests evaluated per day (single leg hop needs more attention).

KTK EQUIPMENT



KTK Scoring Sheet

Name: _____	Gender: _____
Grade: _____	School: _____
DOB: _____	Ethnicity: _____

- Clipboard
- Scoresheets
- Stopwatch / Timer
- Three balance beam sizes (6.0 cm, 4.5 cm & 3.0 cm)
- 1 set of wooden planks
- 12 5cm foam pads
- 1 2-inch wooden divider
- 1 tri-fold mat

MUSCULAR STRENGTH & NEUROMUSCULAR CONTROL ASSESSMENTS

MUSCULAR STRENGTH AND NEUROMUSCULAR CONTROL (MSC TEST)

Limb Movements, during play and during PE,
place a load upon the musculoskeletal system:

UNILATERAL
BILATERAL
CONTRALATERAL



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MOVEMENT OF THE LIMBS CREATES:

MICROSCOPIC BEND/BREAK IN BONES FOR STRONGER RE-GROWTH (bone strength)

MICROSCOPIC TEAR IN MUSCLE FIBERS FOR STRONGER RE-GROWTH (muscle strength)

CREATES MORE EFFICIENT PATHWAYS FROM THE BRAIN TO THE LIMBS (increased neuromuscular control)



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LIMB MOVEMENT:

UNILATERAL



LIMB MOVEMENT

BILATERAL



LIMB MOVEMENT

CONTRALATERAL



WHY TEST MUSCULAR STRENGTH / CONTROL

- Unilateral Balance / Imbalance
 - Will their kayak spin?
- Functional Strength
 - Something to build on
 - Confidence to try new things
- How well does the brain communicate with the feet?



WHERE ARE WE? WHERE DO WE WANT TO BE?

“MA’AM, I HAVE NEVER USED THIS LEG BEFORE.”

- INDIVIDUALS WITH SEVERE MUSCLE STRENGTH OR CONTROL ISSUES?
 - The gymnast, the baseball player, the un-involved
- OVERALL, CLASS RANK IN SINGLE LIMB STRENGTH, DOUBLE LIMB STRENGTH OR LOWER LIMB CONTROL?



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MUSCULAR STRENGTH AND CONTROL TEST (MSC)

DYNAMOMETER HAND GRIP

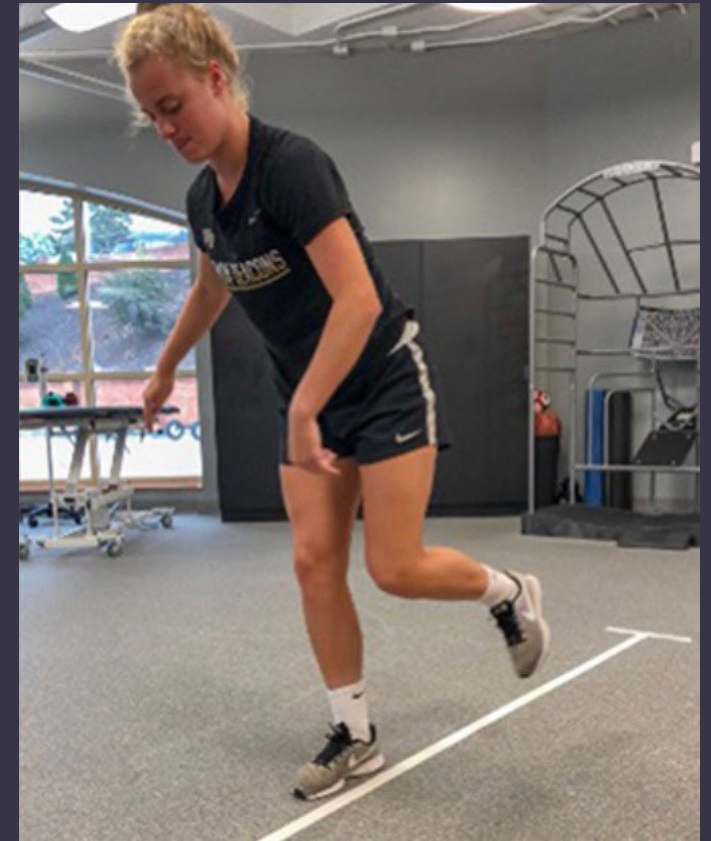
- FUNCTIONAL UNILATERAL HAND/
ARM STRENGTH
- AMAZON: \$26



MUSCULAR STRENGTH AND CONTROL TEST (MSC)

3-HOP TEST

- UNILATERAL LOWER BODY STRENGTH
(JUMP FROM BALANCE, NO LEAD-IN, 3
CONSECUTIVE HOPS)
- OPEN REEL TAPE MEASURE: \$16



MUSCULAR STRENGTH AND CONTRL TEST (MSC)

PUSH-UP

- UPPER BODY BILATERAL STRENGTH
- 30 SECONDS
- OPTIONAL, BALL & RING: \$10 SET



MUSCULAR STRENGTH AND CONTRL TEST (MSC)

VERTICAL JUMP

- LOWER BODY BILATERAL STRENGTH / POWER
- METAL SELF-ADHESIVE 16' TAPE (CUT 8' TO MAKE 2 SETS): \$22



MUSCULAR STRENGTH AND CONTROL TEST (MSC)

SIDE-STEP TEST

- START INSIDE LINES. STEP OUT/IN RIGHT, OUT/IN LEFT, REPEAT FOR 20 SECONDS
- MASKING TAPE OR COURT TAPE



TESTING LOGISTICS

- 1 instructor, 10 students = All 5 tests within 20 min.
 - 20 -30 students complete per day depending on length of PE class
- 3 instructors, 3 rotation groups = 30-40 students in 30 minutes
- 5 Rotations: for older children. Honor system.



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SKILL PRACTICE STATIONS

- Station 1: BIA
- Station 2: Balance Beam
- Station 3: Single Leg Hop
- Station 4: Sideways Steps
- Station 5: Lateral Jump
- Station 6: MSC Tests

1. Split into groups of 12
2. Each group will start at one of the 6 stations
3. Our team will call out the scores and do the timing
4. Rotate every 3 minutes

STATION GROUPS: FOLLOW UP DISCUSSION

- Would you use this assessment?
- What would be the purpose to use the assessment?
- Organizing with different class sizes?
- How many days depends on your purpose?
- Other thoughts about how to use the assessments?

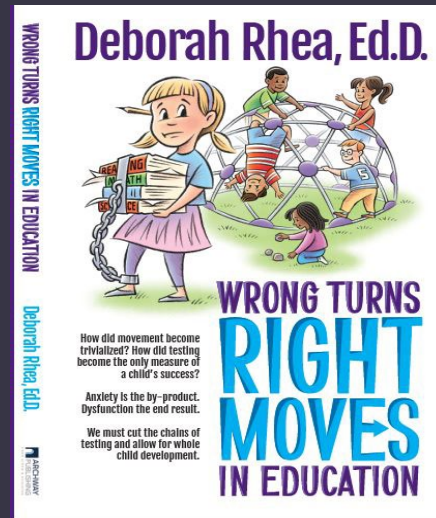
WRAP-UP

POSTER PRESENTATION

- **Friday 8:30-10:00 am American Bank Center – Garrett Ballroom Foyer – 2nd floor**

“Determining Muscular Strength and Neuromuscular Control in Elementary Children Who Participate in Different Amounts of Recess”

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