

# Childhood Obesity and Functional Motor Skills: Can our schools help?

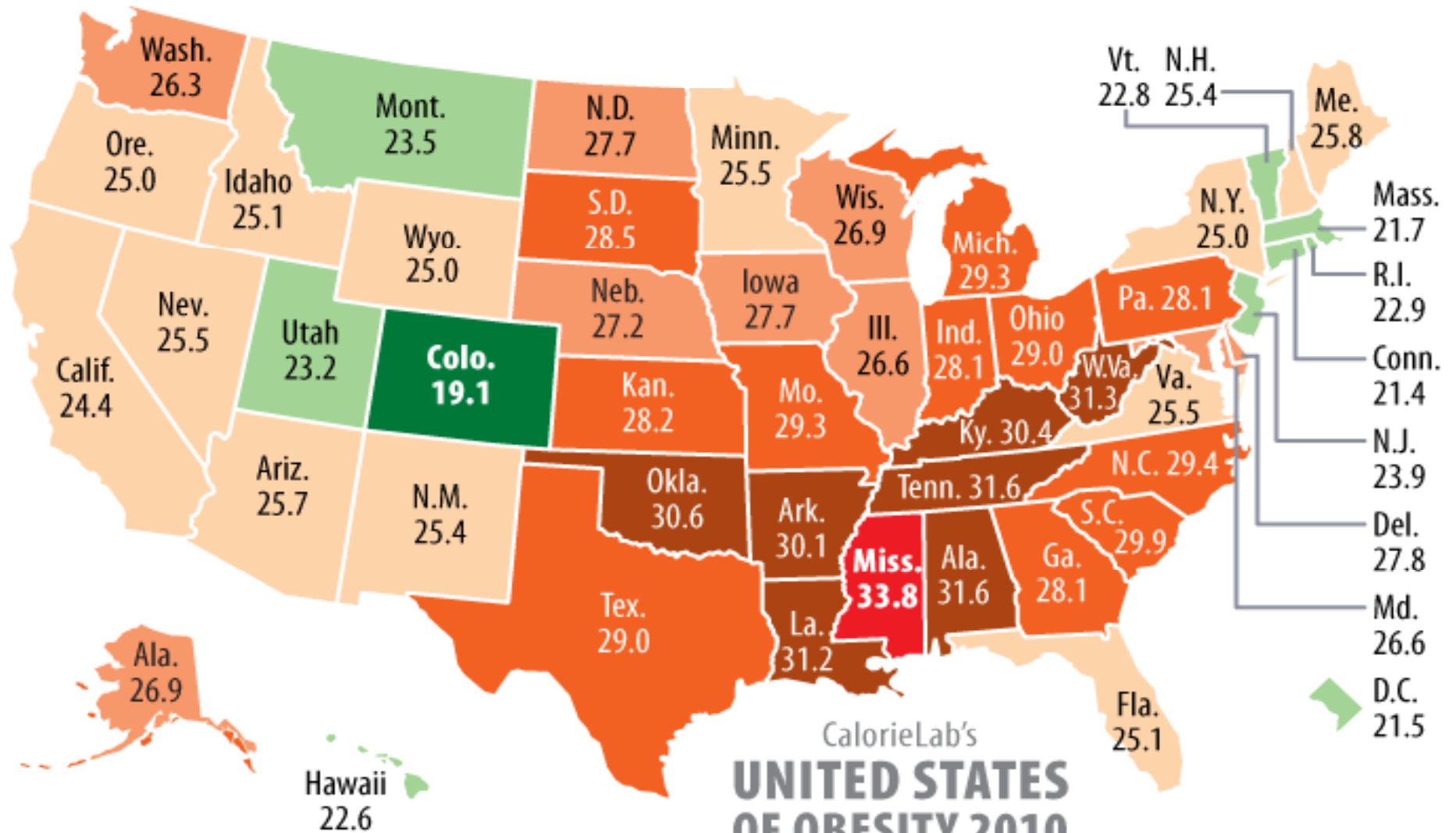
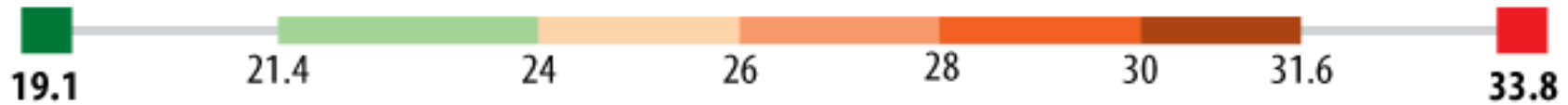
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**Leanest State**  
**Colorado**

### Percentage of Obese Adult Population

(3-year average from 2007-09 CDC Behavioral Risk Factor Surveillance System data)

**Fattest State**  
**Mississippi**



Parental  
Noncompliance

Sedentary  
Lifestyle

Genetics

**Childhood Obesity**

Poor  
Diet

Media

Poor Functional  
Motor Skills

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Sedentary Lifestyle

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**Childhood Obesity**

Poor Diet

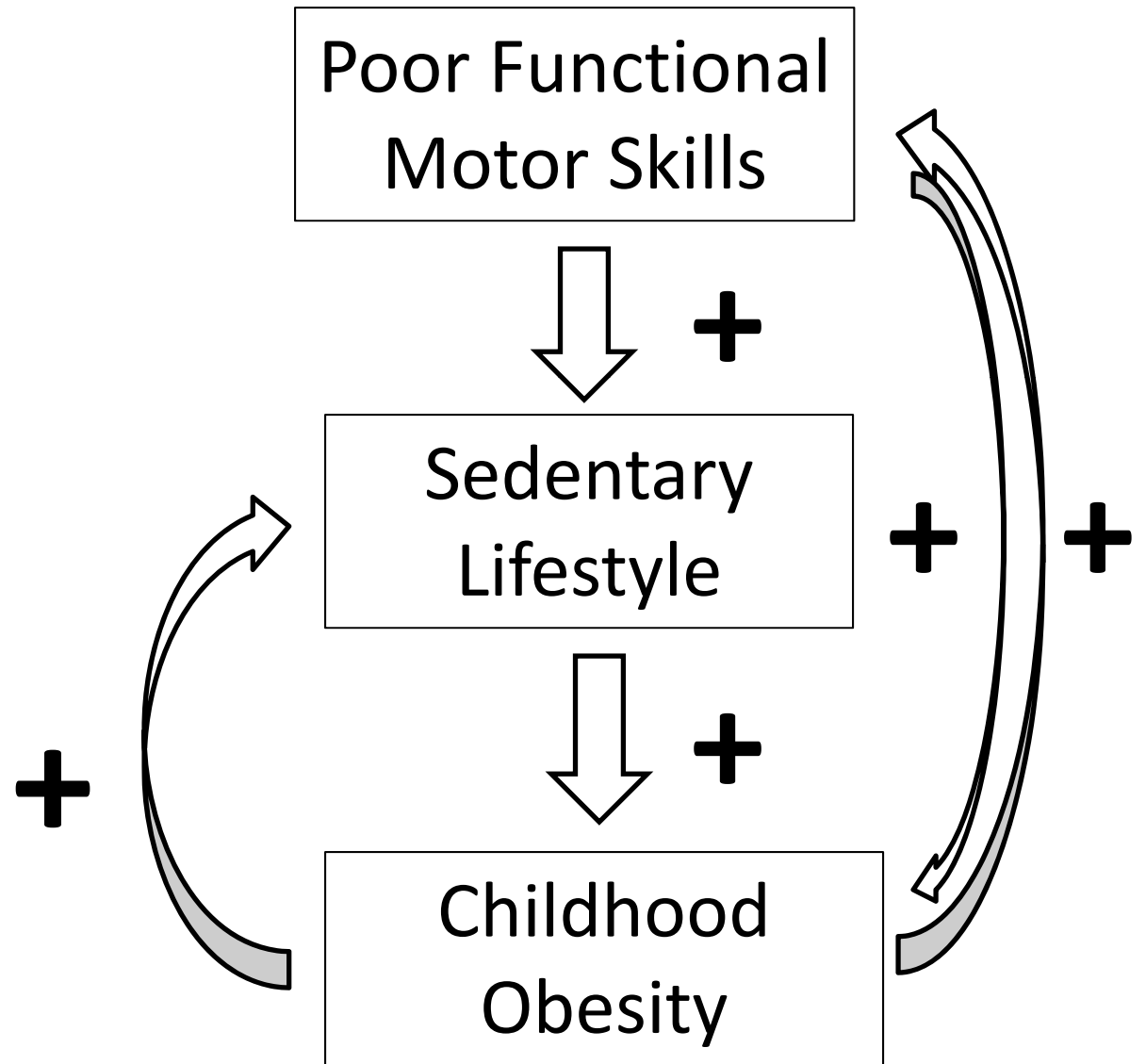
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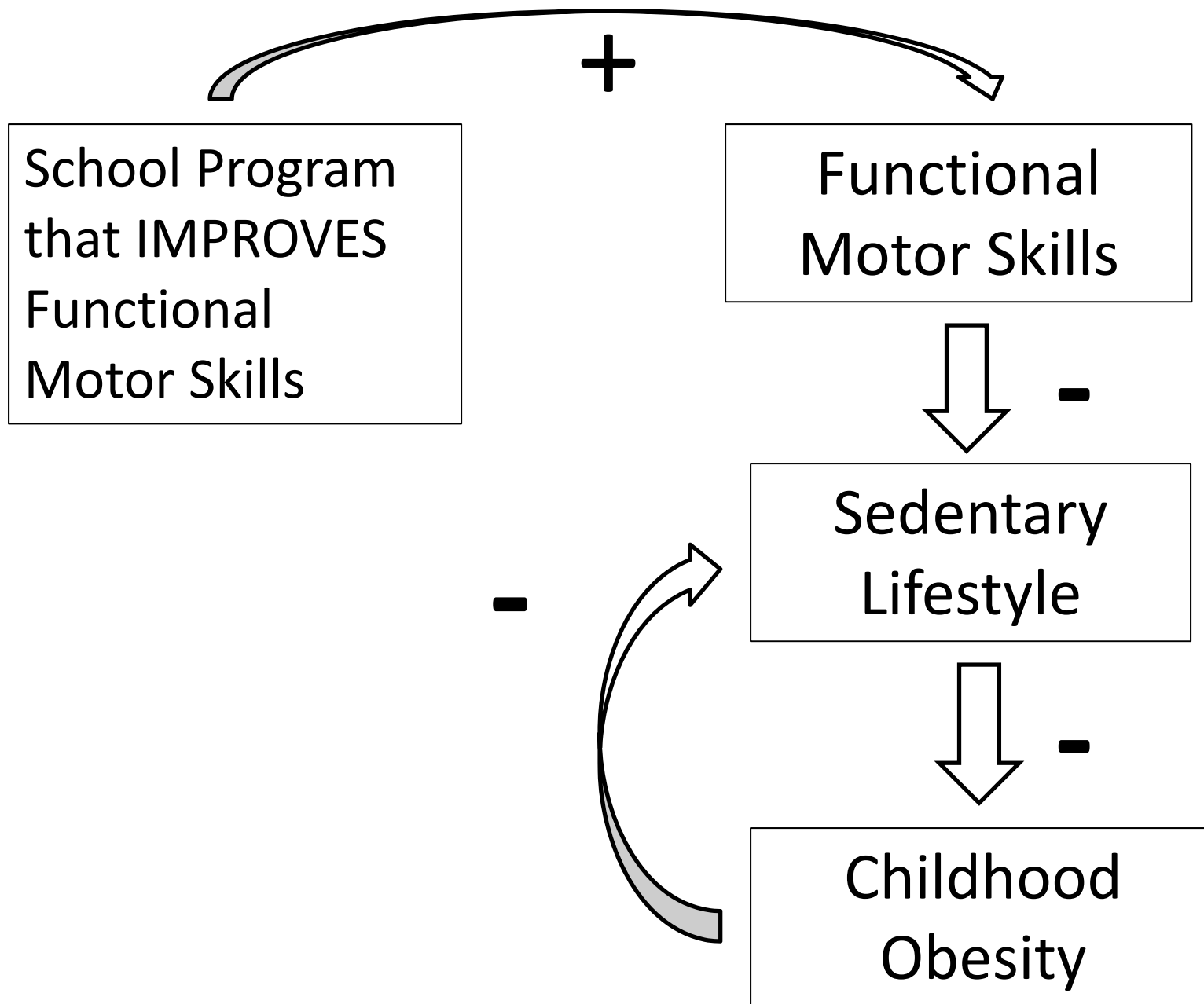
Poor Functional Motor Skills

# Functional Motor Skills

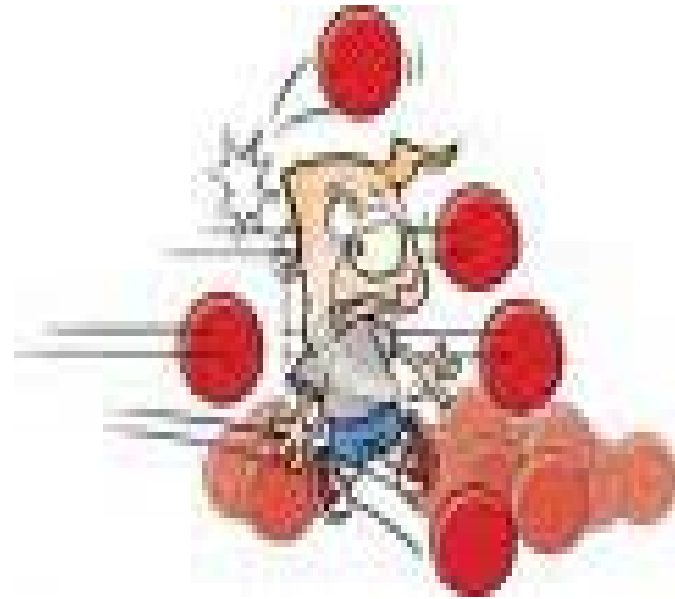
- The basic physical skills used to coordinate movements
- Skills needed to do things like run, jump, catch, hit a baseball, dribble a basketball, etc.
- Skills needed for children to go out and be active adolescents and adults.







# The Old Days



# MORNING MADNESS



# Walk to School and Walk to Walk

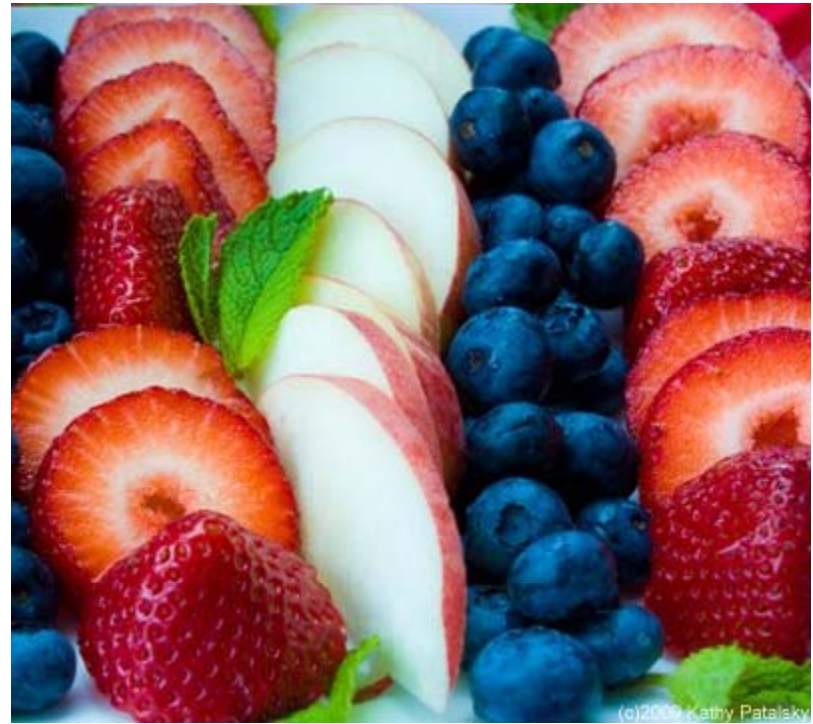


- 2004 Sidewalks Paved
- Over 95% student body lives within 1 mile of school
- Went down to 1 bus for entire student body
- Majority of Students now walk to school
- 2 scheduled 15 minute walks during school day

# Welcome to the Future: Alternative PE



# Healthy Meals/Fruit Snack Cart



# Study the Effectiveness

- Participants: All 3<sup>rd</sup> Grade Students at Pioneer Elementary and a control school with similar demographics.
- Both school have high percentages of minority students and the majority of children receive free and reduced lunch.
- Administer Test of Gross Motor Development-2<sup>nd</sup> Edition to all 3<sup>rd</sup> Grade students at both schools at the beginning of the school year and near the end of school year.
- Allow us to measure improvement in functional motor skills over the school year.

# Test of Gross Motor Development

## Locomotor Skills

1. Run
2. Gallop
3. Hop
4. Leap
5. Horizontal Jump
6. Slide

## Object Control Skills

1. Striking a stationary ball
2. Stationary Dribble
3. Catch
4. Kick
5. Overhand Throw
6. Underhand Roll



# Calculating Scores

- Calculate total score for both subtests (locomotor and object control)
- Get a Standardized score that translates into a Gross Motor Quotient (adjusted score for age)
- Descriptive rating from very poor to very superior



# Population

Pioneer	Control	Total
47	25	72
20 males 27 females	10 males 15 female	30 males 42 females

# BMI of Population

BMI Category	Pioneer (47)	Control School (25)	Total (72)
Normal	19(40%)	15 (60%)	33 (47%)
Overweight	12 (2%)	4 (16%)	15 (21%)
Obese	16 (34%)	6(24%)	23 (32%)

Pioneer 1 <sup>st</sup> Test	Total (47)	Normal (19)	Overweight (12)	Obese (16)
Very Poor	6 (13%)	1	0	5
Poor	11 (23%)	3	2	6
Below Avg	8 (17%)	3	3	2
Average	21 (44%)	11	7	3
Above Avg	1 (2%)	1	0	0
Superior	0 (0%)	0	0	0

Pioneer 2 <sup>nd</sup> Test	Total	Normal	Overweight	Obese
Very Poor	2 (4%)	0	0	2
Poor	3 (6%)	1	0	2
Below Avg	5 (11%)	3	1	2
Average	30 (64%)	12	10	8
Above Avg	6 (13%)	2	2	2
Superior	1 (2%)	1	0	0

<b>Control 1<sup>st</sup> Test</b>	<b>Total (25)</b>	<b>Normal (15)</b>	<b>Overweight (3)</b>	<b>Obese (7)</b>
<b>Very Poor</b>	<b>7 (28%)</b>	<b>2</b>	<b>1</b>	<b>4</b>
<b>Poor</b>	<b>9 (36%)</b>	<b>6</b>	<b>1</b>	<b>2</b>
Below Avg	5 (20%)	5	0	0
Average	4 (16%)	2	1	1
Above Avg	0 (0%)	0	0	0
Superior	0 (0%)	0	0	0

<b>Control 2<sup>nd</sup> Test</b>	<b>Total</b>	<b>Normal</b>	<b>Overweight</b>	<b>Obese</b>
<b>Very Poor</b>	<b>8 (32%)</b>	<b>3</b>	<b>1</b>	<b>4</b>
<b>Poor</b>	<b>8 (32%)</b>	<b>6</b>	<b>1</b>	<b>1</b>
Below Avg	4 (16%)	1	1	2
Average	5 (20%)	5	0	0
Above Avg	0 (0%)	0	0	0
Superior	0 (0%)	0	0	0

# Change in GMQ Classification

<b>Pioneer</b>	<b>Total (47)</b>	<b>Normal (19)</b>	<b>Overweight (12)</b>	<b>Obese (15)</b>
<b>Improved</b>	<b>24 (51%)</b>	<b>9</b>	<b>5</b>	<b>10</b>
<b>Decreased</b>	<b>5 (11%)</b>	<b>4</b>	<b>0</b>	<b>1</b>
No change	18 (38%)	6	7	4

<b>Control</b>	<b>Total (25)</b>	<b>Normal (15)</b>	<b>Overweight (3)</b>	<b>Obese (7)</b>
<b>Improved</b>	<b>9 (36%)</b>	<b>6</b>	<b>1</b>	<b>2</b>
<b>Decreased</b>	<b>7 (28%)</b>	<b>4</b>	<b>2</b>	<b>1</b>
No change	9 (36%)	5	0	4

- i.e. Improvement in Descriptive Rating (for example Poor to Average, etc.)

# All Participants Functional Performance

1 <sup>st</sup> Test	Pioneer (47)	Control (25)
Inadequate Skills(GMQ $\leq$ 79)	17 (36%)	16 (64%)
Adequate Skills (GMQ $\geq$ 80)	30 (64%)	9 (36%)

2 <sup>nd</sup> Test	Pioneer	Control
Inadequate Skills	5(10%)	16 (64%)
Adequate Skills	42 (90%)	9(36%)

# Obese Participants Functional Performance

1 <sup>st</sup> Test	Pioneer (16)	Control (7)
Inadequate Skills	11 (69%)	6 (86%)
Adequate Skills	5 (31%)	1 (14%)

2 <sup>nd</sup> Test	Pioneer	Control
Inadequate Skills	4 (25%)	5 (71%)
Adequate Skills	12(75%)	2 (29%)

# Obese Participants Change in Classification

	Improved	Decreased	No change
Pioneer	10 (63%)	1 (6%)	5 (31%)
Control	2 (28%)	1 (14%)	4 (57%)

# Conclusions

- The participants from Pioneer had higher baseline scores than the control school.
- The participants at Pioneer demonstrated higher rates of improvement in functional motor skills compared to our control school.
- These improvements in scores were most impressive in the participants in the obese BMI category at Pioneer.
- The participants from the control school did not demonstrate this level of improved performance in any BMI category.

# Conclusions

- In designing physical fitness programs for elementary schools with similar socioeconomic demographics, educators should consider using Pioneer's program as a model for improving functional motor skills of children from all BMI classifications.

# Acknowledgements

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Questions?