

**PROM/SE Summer Science Institutes  
June 20-23, 2005**

**Measuring the  
Curriculum Topic of  
*ENERGY*  
In Ohio**

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# ENERGY in Ohio Elementary School Reports

**INSTRUCTION**

**ACHIEVEMENT**

**OHIO STATE BENCHMARK**

***ENERGY***

***ENERGY***  
Energy types, sources,  
conversions

PS.F Describe the properties of light and sound energy.

PS.C Describe the forces that directly affect objects and their motion.

**Display 14**

**Display 26**

## Science Topics Intended at Each Grade in Ohio's Science Standards

	Grade							
Topics	1	2	3	4	5	6	7	8
Energy types, sources, conversions	■	■				■	■	■

**Display 3**

Topic intended ■

# ENERGY in Ohio Middle School Reports

## INSTRUCTION

**ENERGY**

**Display 14**

## ACHIEVEMENT

**ENERGY**

Energy types, sources,  
conversions

**Display 28**

## OHIO STATE BENCHMARK

PS.C Describe renewable and nonrenewable sources of energy (e.g., solar, wind, fossil fuels, biomass, hydroelectricity, geothermal and nuclear energy) and the management of these sources.

PS.D Describe that energy takes many forms, some forms represent kinetic energy and some forms represent potential energy; and during energy transformations the total amount of energy remains constant.

**Science Topics Intended at Each Grade in Ohio's Science Standards**

Topics	Grade							
	1	2	3	4	5	6	7	8
Energy types, sources, conversions	■	■				■	■	■

**Display 3**

Topic intended ■

# ENERGY in Ohio's Science Standards: Display 3

Display 3: Science Topics Intended at Each Grade in Ohio's Science Standards

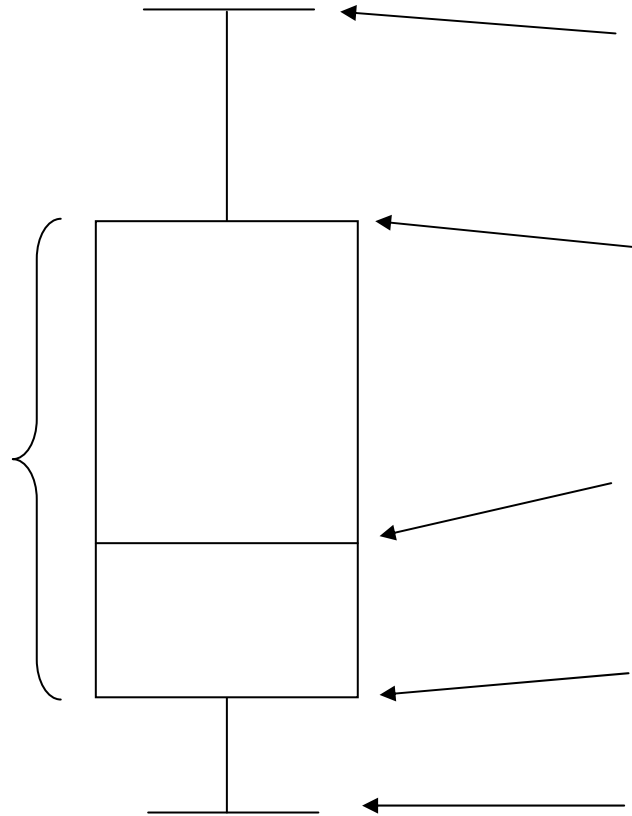
Topics	Grade							
	1	2	3	4	5	6	7	8
<b>Life Science</b>								
Organs, Tissues	■	■	■	■	■	■	■	■
Plants, Fungi	■	■	■	■	■	■	■	■
Animals	■	■	■	■	■	■	■	■
Life Cycles			■	■	■	■	■	■
Interdependence of Life	■	■	■	■	■	■	■	■
Habitats & Niches		■	■	■	■	■	■	■
Biomes & Ecosystems		■			■		■	
Reproduction					■	■	■	■
Organism Energy Handling					■	■	■	■
Cells						■	■	■
Human Nutrition							■	■
Organism Sensing & Responding							■	■
<b>Physical Science</b>								
Physical Properties of Matter	■		■	■	■	■	■	■
Classification of Matter	■		■	■	■	■	■	■
Light		■	■	■	■	■	■	■
Electricity			■	■	■	■	■	■
Physical Changes of Matter	■		■	■	■	■	■	■
Heat & Temperature			■	■	■	■	■	■
Time, Space, Motion	■		■	■	■	■	■	■
Types of Forces	■		■	■	■	■	■	■
Magnetism	■			■	■	■	■	■
Atoms, Ions, Molecules				■	■	■	■	■
Chemical Properties of Matter				■	■	■	■	■
Chemical Changes of Matter	■			■	■	■	■	■
Explanations of Physical Changes				■	■	■	■	■
Sound & Vibration		■			■	■	■	■
Energy Types, Sources, Conversions	■	■			■	■	■	■
Dynamics of Motion			■				■	■
<b>Earth Science</b>								
Rocks, Soil			■	■	■	■	■	■
Bodies of Water			■	■	■	■	■	■
Weather & Climate	■	■	■	■	■	■	■	■
Planets in the Solar System			■	■	■	■	■	■
Earth's Composition			■	■	■	■	■	■
Earth in the Solar System	■	■	■	■	■	■	■	■
Physical Cycles			■	■	■	■	■	■
Land Forms				■	■	■	■	■
Atmosphere				■	■	■	■	■
Building & Breaking			■	■	■	■	■	■
<b>Environmental Science</b>								
Land, Water, Sea Resource Conservation	■				■	■	■	■
Material & Energy Resource Conservation	■				■	■	■	■
Pollution							■	■

# of additional topics covered at grade level, on average

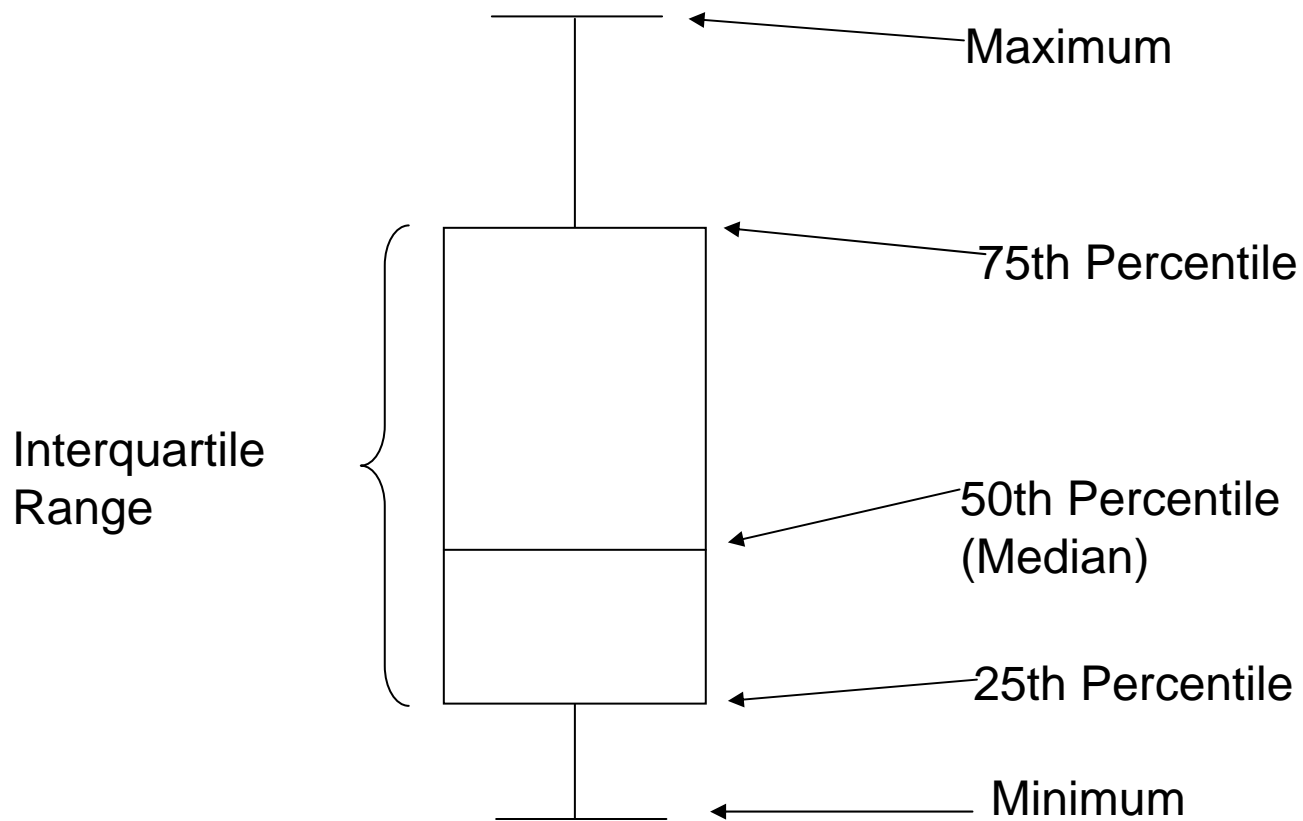
Intended in the State's Content Standards ■

1995 TIMSS Top-achieving countries' intended-topics profile ■

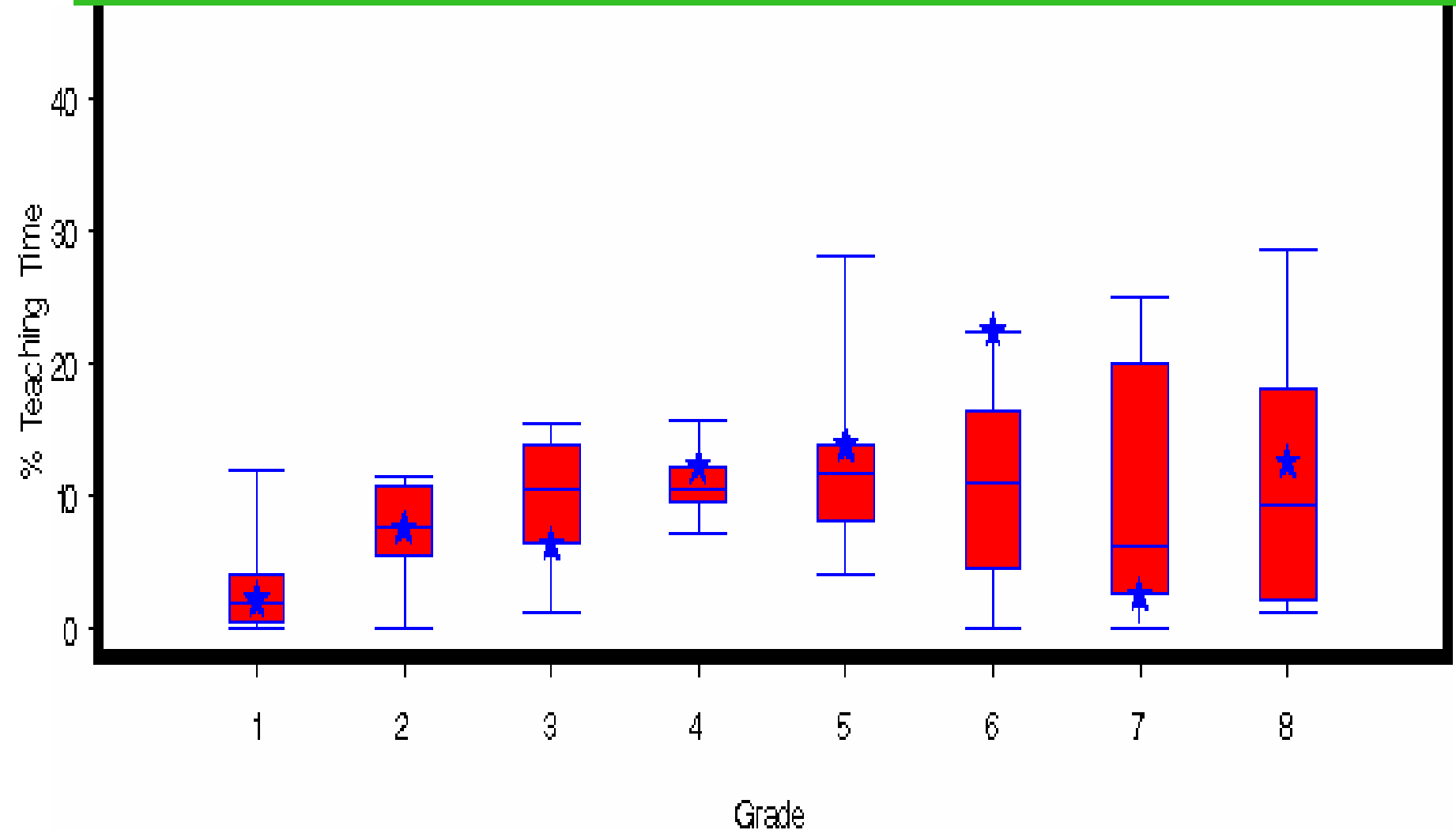
# Boxplot



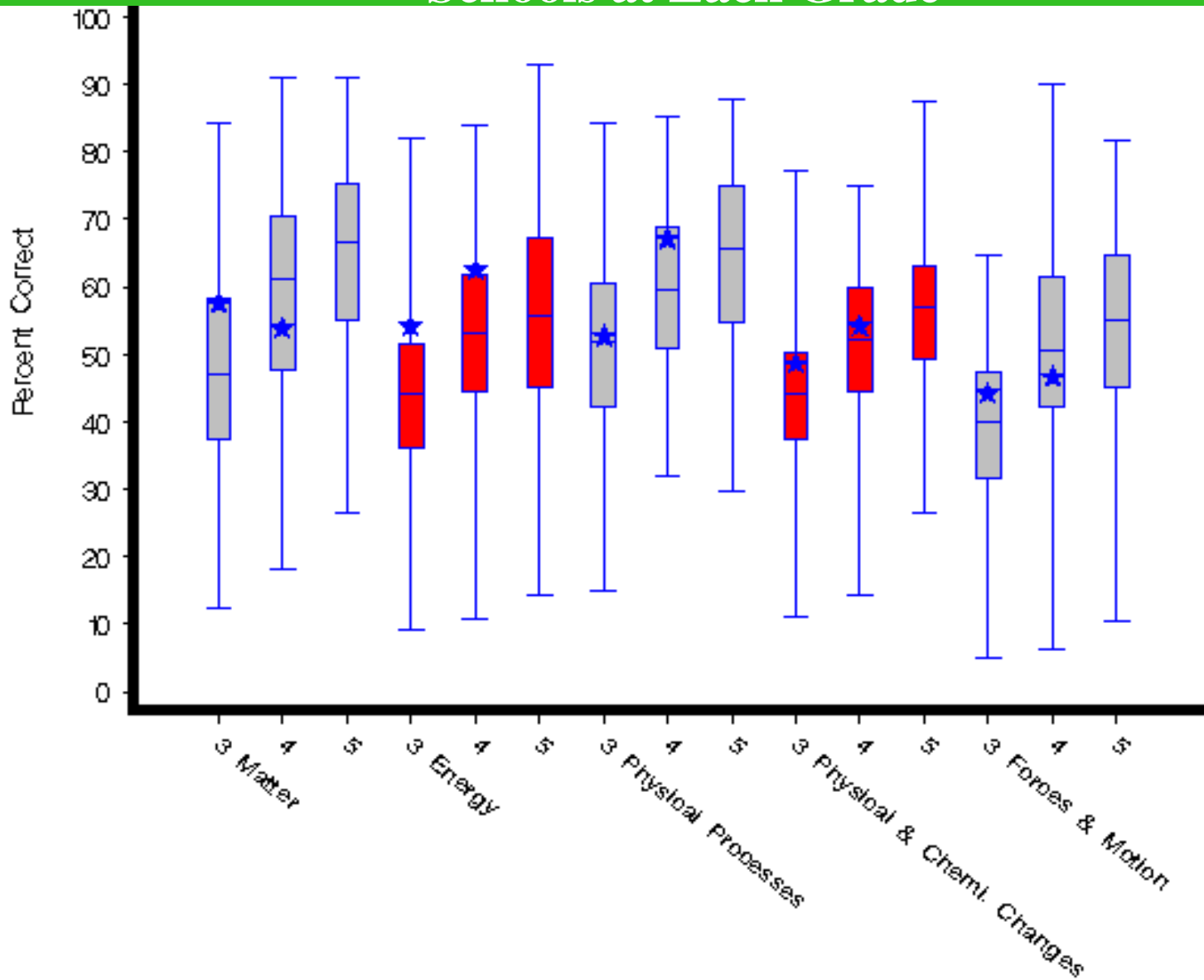
# Boxplot



# Display 14: Boxplots of Percent Teaching Time for ENERGY Across Teachers at Each Grade for a District

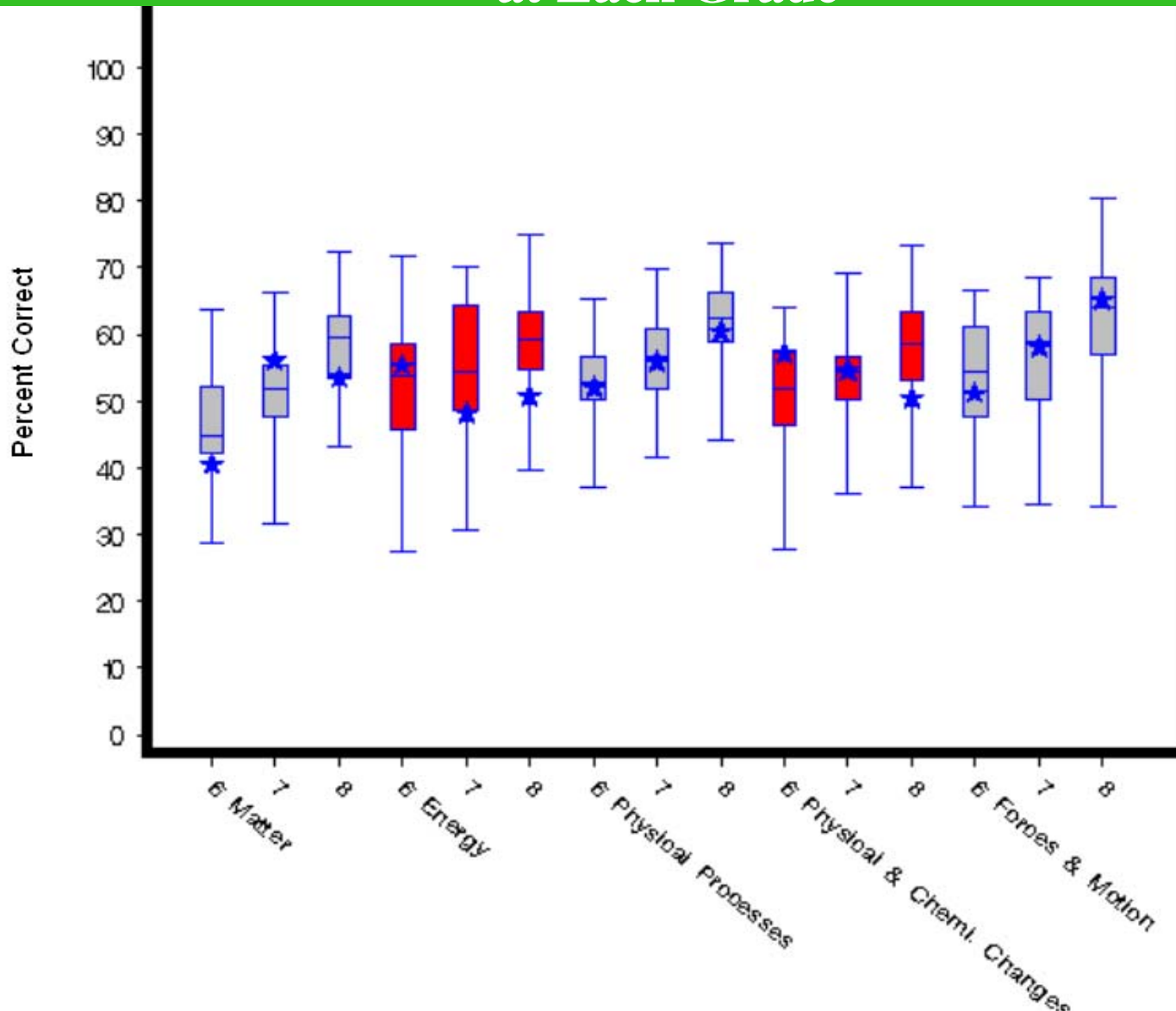


# Display 26: Boxplots of Average Percent Correct on Elementary Physical Science Strands Across all PROM/SE Schools at Each Grade

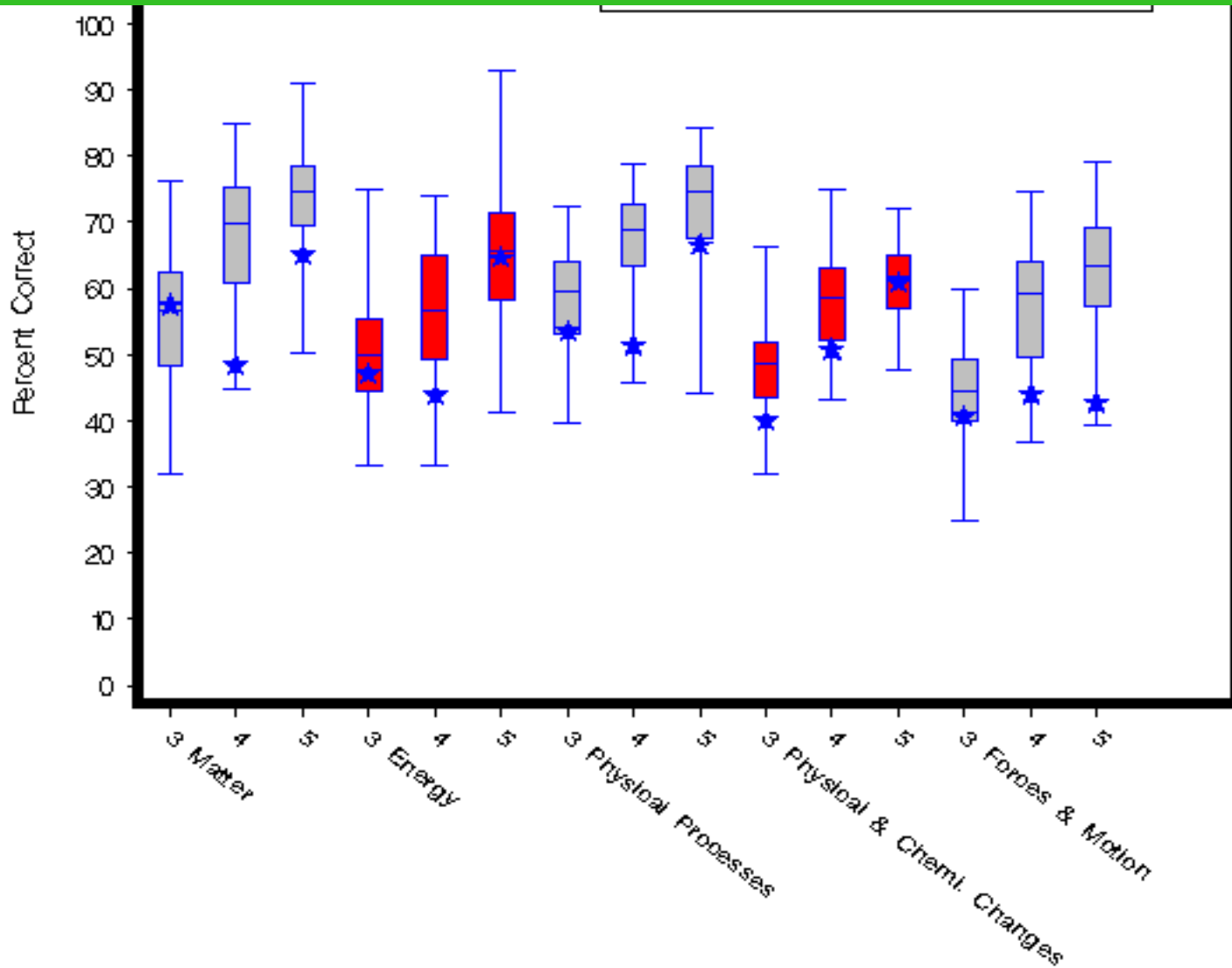




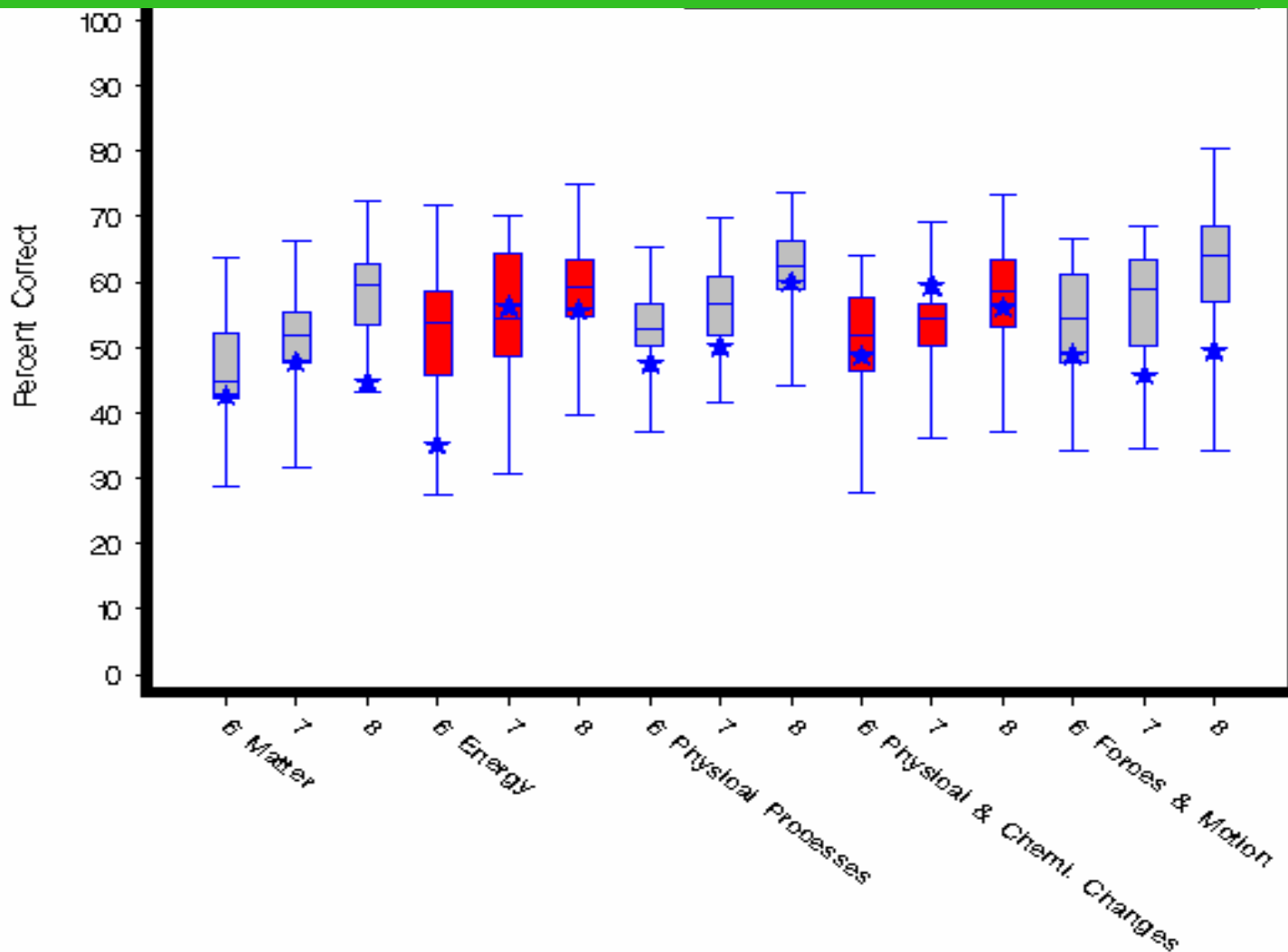
# Display 28: Boxplots of Average Percent Correct on Middle School Physical Science Strands Across all PROM/SE Schools at Each Grade



# Boxplots of Average Percent Correct on Elementary Physical Science Strands for All PROM/SE Districts at Each Grade



# Boxplots of Average Percent Correct on Middle School Physical Science Strands for All PROM/SE Districts at Each Grade



# Distribution of Simulated Percent Correct Score at Each Grade



# Percent of PROM/SE Students Reaching Each Level for the Category of ENERGY at Each Grade Level

Grade	Fail.	C	B	A	A+
3	63	13	10	9	7
4	49	14	12	11	14
5	39	14	13	13	20
6	59	13	11	9	8
7	54	15	12	11	10
8	47	13	13	13	14
9	76	11	7	4	2
10	70	12	9	5	3
11	66	13	10	6	4
12	67	13	10	6	4

Preliminary Data

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