Physical Science Comes Alive:
Energy Systems Grades 4 – 5 (ElectroCity)

Alignments to State Math Standards

Table of Contents

California State Science Content Standards
Physical Science Comes Alive: Energy Systems Grades 4 – 5 (ElectroCity)

Lesson #	California State Science Content Standards	
	Grade Four	**Grade Five**
1. **Light & Sound**	MR: 1.0-2, 2.0, 2.2-3, 3.0-3	MR: 1.0-2, 2.0, 2.2-3, 3.0-3
2. **Make a Switch**	MR: 1.0-2, 2.0, 2.2-3, 3.0-3	MR: 1.0-2, 2.0, 2.2-3, 3.0-3
3. **Circuit diagrams**	MR: 1.0-2, 2.0, 2.2-3, 3.0-3	MR: 1.0-2, 2.0, 2.2-3, 3.0-3
4. **Motors, series & parallel circuits**	MR: 1.0-2, 2.0, 2.2-3, 3.0-3	MR: 1.0-2, 2.0, 2.2-3, 3.0-3
5. **Make a simple ElectroCity!**	MR: 1.0-2, 2.0, 2.2-3, 3.0-3	MR: 1.0-2, 2.0, 2.2-3, 3.0-3
6. **Hidden Switches**	MR: 1.0-2, 2.0, 2.2-3, 3.0-3	MR: 1.0-2, 2.0, 2.2-3, 3.0-3
7. **Magnets & Conductors**	MR: 1.0-2, 2.0, 2.2-3, 3.0-3	MR: 1.0-2, 2.0, 2.2-3, 3.0-3
8. **Magnetic proximity switches**	MR: 1.0-2, 2.0, 2.2-3, 3.0-3	MR: 1.0-2, 2.0, 2.2-3, 3.0-3
9. **Vibrators, Noisemakers, Remotes & Things that Glow in the Dark**	MR: 1.0-2, 2.0, 2.2-3, 3.0-3	MR: 1.0-2, 2.0, 2.2-3, 3.0-3
10. **Design an Automatic ElectroCity**	MR: 1.0-2, 2.0, 2.2-3, 3.0-3	MR: 1.0-2, 2.0, 2.2-3, 3.0-3
11. **Make an Automatic ElectroCity**	MR: 1.0-2, 2.0, 2.2-3, 3.0-3	MR: 1.0-2, 2.0, 2.2-3, 3.0-3
12. **Present your ElectroCity**		
Key	MR (Mathematical Reasoning)	MR (Mathematical Reasoning)

Full Description of Standards

California Mathematical Content Standards – Grade 4
Mathematical Reasoning
1.0 Students make decisions about how to approach problems: 1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, sequencing and prioritizing information, and observing patterns. 1.2 Determine when and how to break a problem into simpler parts. 2.0 Students use strategies, skills, and concepts in finding solutions: 2.2 Apply strategies and results from simpler problems to more complex problems. 2.3 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning. 3.0 Students move beyond a particular problem by generalizing to other situations: 3.1 Evaluate the reasonableness of the solution in the context of the original situation. 3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems. 3.3 Develop generalizations of the results obtained and apply them in other circumstances.

California Mathematical Content Standards – Grade 5
Mathematical Reasoning
1.0 Students make decisions about how to approach problems: 1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, sequencing and prioritizing information, and observing patterns. 1.2 Determine when and how to break a problem into simpler parts. 2.0 Students use strategies, skills, and concepts in finding solutions: 2.2 Apply strategies and results from simpler problems to more complex problems. 2.3 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning. 3.0 Students move beyond a particular problem by generalizing to other situations: 3.1 Evaluate the reasonableness of the solution in the context of the original situation. 3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems. 3.3 Develop generalizations of the results obtained and apply them in other circumstances.

District of Columbia Mathematical Standards
Physical Science Comes Alive: Energy Systems Grades 4 – 5 (ElectroCity)

Lesson #	District of Columbia Mathematical Standards	
	Grade Four	**Grade Five**
1. Light & Sound	4.DASP.1	5.DASP.2
2. Make a Switch	4.DASP.1	5.DASP.2
3. Circuit diagrams	4.DASP.1	5.DASP.2
4. Motors, series & parallel circuits	4.DASP.1	5.DASP.2
5. Make a simple ElectroCity!	4.DASP.1	5.DASP.2
6. Hidden Switches	4.DASP.1	5.DASP.2
7. Magnets & Conductors	4.DASP.1	5.DASP.2
8. Magnetic proximity switches	4.DASP.1	5.DASP.2
9. Vibrators, Noisemakers, Remotes & Things that Glow in the Dark	4.DASP.1	5.DASP.2
10. Design an Automatic ElectroCity	4.DASP.1	5.DASP.2
11. Make an Automatic ElectroCity	4.DASP.1	5.DASP.2
12. Present your ElectroCity	4.DASP.1	5.DASP.2
Key	DASP (Data Analysis, Statistics and Probability)	

Full Description of Standards

District of Columbia Mathematics Standards – Grade 4
Data Analysis, Statistics and Probability
4.DASP.1. Collect and organize data using observations, measurements, surveys, or experiments, and identify appropriate ways to display the data.

District of Columbia Mathematics Standards – Grade 5
Data Analysis, Statistics and Probability
5.DASP.2. Construct, draw conclusions, and make predictions from various representations of data sets, including tables, line graphs, line plots, circle graphs, and bar graphs (where symbols or scales represent multiple units).

Minnesota Academic Standards – Mathematics
Physical Science Comes Alive: Energy Systems Grades 4 – 5 (ElectroCity)

Lesson #	Minnesota Academic Standards – Mathematics	
	Grade Four	**Grade Five**
1. **Light & Sound**	N/A	N/A
2. **Make a Switch**	N/A	N/A
3. **Circuit diagrams**	N/A	N/A
4. **Motors, series & parallel circuits**	N/A	N/A
5. **Make a simple ElectroCity!**	N/A	N/A
6. **Hidden Switches**	N/A	N/A
7. **Magnets & Conductors**	N/A	N/A
8. **Magnetic proximity switches**	N/A	N/A
9. **Vibrators, Noisemakers, Remotes & Things that Glow in the Dark**	N/A	N/A
10. **Design an Automatic ElectroCity**	N/A	N/A
11. **Make an Automatic ElectroCity**	N/A	N/A
12. **Present your ElectroCity**	N/A	N/A

NY State Learning Standards for Mathematics
Physical Science Comes Alive: Energy Systems Grades 4 – 5 (ElectroCity)

Lesson #	NY State Learning Standards for Mathematics	
	Grade Four	Grade Five
1. Light & Sound	PS: 1-13, 16-25 S: 1-2, 5-6	PS: 1-13, 16-23
2. Make a Switch	PS: 1-13, 16-25 S: 1-2, 5-6	PS: 1-13, 16-23
3. Circuit diagrams	PS: 1-13, 16-25 S: 1-2, 5-6	PS: 1-13, 16-23
4. Motors, series & parallel circuits	PS: 1-13, 16-25 S: 1-2, 5-6	PS: 1-13, 16-23
5. Make a simple ElectroCity!	PS: 1-13, 16-25 S: 1-2, 5-6	PS: 1-13, 16-23
6. Hidden Switches	PS: 1-13, 16-25 S: 1-2, 5-6	PS: 1-13, 16-23
7. Magnets & Conductors	N/A	N/A
8. Magnetic proximity switches	PS: 1-13, 16-25 S: 1-2, 5-6	PS: 1-13, 16-23
9. Vibrators, Noisemakers, Remotes & Things that Glow in the Dark	PS: 1-13, 16-25 S: 1-2, 5-6	PS: 1-13, 16-23
10. Design an Automatic ElectroCity	PS: 1-13, 16-25 S: 1-2, 5-6	PS: 1-13, 16-23
11. Make an Automatic ElectroCity	PS: 1-13, 16-25 S: 1-2, 5-6	PS: 1-13, 16-23
12. Present your ElectroCity		
Key	PS (Problem Solving) S (Statistics and Probability)	

Full Description of Standards

NY State Learning Standards for Mathematics – Grade 4

Problem Solving

4.PS.1 Explore, examine, and make observations about a social problem or mathematical situation
4.PS.2 Understand that some ways of representing a problem are more helpful than others
4.PS.3 Interpret information correctly, identify the problem, and generate possible solutions
4.PS.5 Formulate problems and solutions from everyday situations
4.PS.6 Translate from a picture/diagram to a numeric expression
4.PS.7 Represent problem situations in oral, written, concrete, pictorial, and graphical forms
4.PS.8 Select an appropriate representation of a problem
4.PS.9 Use trial and error to solve problems
4.PS.10 Use process of elimination to solve problems
4.PS.11 Make pictures/diagrams of problems
4.PS.12 Use physical objects to model problems
4.PS.13 Work in collaboration with others to solve problems
4.PS.16 Analyze problems by identifying relationships
4.PS.17 Analyze problems by identifying relevant versus irrelevant information
4.PS.18 Analyze problems by observing patterns
4.PS.19 State a problem in their own words
4.PS.20 Determine what information is needed to solve a problem
4.PS.21 Discuss with peers to understand a problem situation
4.PS.22 Discuss the efficiency of different representations of a problem
4.PS.23 Verify results of a problem
4.PS.24 Recognize invalid approaches
4.PS.25 Determine whether a solution is reasonable in the context of the original problem

Statistics and Probability

4.S.1 Design investigations to address a question from given data
4.S.2 Collect data using observations, surveys, and experiments and record appropriately
4.S.5 Develop and make predictions that are based on data
4.S.6 Formulate conclusions and make predictions from graphs

NY State Learning Standards for Mathematics – Grade 5
Problem Solving
5.PS.1 Know the difference between relevant and irrelevant information when solving problems 5.PS.2 Understand that some ways of representing a problem are more efficient than others 5.PS.3 Interpret information correctly, identify the problem, and generate possible strategies and solutions 5.PS.4 Act out or model with manipulatives activities involving mathematical content from literature 5.PS.5 Formulate problems and solutions from everyday situations 5.PS.6 Translate from a picture/diagram to a numeric expression 5.PS.7 Represent problem situations verbally, numerically, algebraically, and/or graphically 5.PS.8 Select an appropriate representation of a problem 5.PS.9 Understand the basic language of logic in mathematical situations (and, or, not) 5.PS.10 Work in collaboration with others to solve problems 5.PS.11 Translate from a picture/diagram to a number or symbolic expression 5.PS.12 Use trial and error and the process of elimination to solve problems 5.PS.13 Model problems with pictures/diagrams or physical objects 5.PS.16 Discuss with peers to understand a problem situation 5.PS.17 Determine what information is needed to solve problem 5.PS.18 Determine the efficiency of different representations of a problem 5.PS.19 Differentiate between valid and invalid approaches 5.PS.20 Understand valid counterexamples 5.PS.21 Explain the methods and reasoning behind the problem solving strategies used 5.PS.22 Discuss whether a solution is reasonable in the context of the original problem 5.PS.23 Verify results of a problem