

**Physical Science Comes Alive
Energy Systems for 2nd / 3rd grade (Fantastic Elastic)**

Alignments to State Math Standards

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California Mathematical Content Standards
Physical Science Comes Alive Energy Systems for 2nd / 3rd grade (Fantastic Elastic)

| Lesson # | California Mathematical Content Standards | |
|--|---|---|
| | Grade 2 | Grade 3 |
| 1. What is a Wind-up? | MG: 2.0 MR: 1.0-2, 2.0-1, 3.0 | MG: 2.0, 5-6 SDAP: 1.1 MR: 1.0-2, 2.0-3, 5, 3.0-3 |
| 2. Make a Wind-up | MG: 2.0 MR: 1.0-2, 2.0-1, 3.0 | MG: 2.0, 5-6 SDAP: 1.1 MR: 1.0-2, 2.0-3, 5, 3.0-3 |
| 3. Troubleshooting Wind-ups | MG: 2.0 MR: 1.0-2, 2.0-1, 3.0 | MG: 2.0, 5-6 SDAP: 1.1 MR: 1.0-2, 2.0-3, 5, 3.0-3 |
| 4. How to Build a Wind-up | MG: 2.0 | SDAP: 1.1 MR: 1.0-2 |
| 5. Redesign your Wind-up | MG: 2.0 MR: 1.0-2, 2.0-1, 3.0 | MG: 2.0, 5-6 SDAP: 1.1 MR: 1.0-2, 2.0-3, 5, 3.0-3 |
| 6. How a Wind-up Works | MG: 2.0 MR: 1.0-2, 2.0-1, 3.0 | MG: 2.0, 5-6 SDAP: 1.1 MR: 1.0-2, 2.0-3, 5, 3.0-3 |
| 7. How could a Balloon Power a Car? | MG: 2.0 MR: 1.0-2, 2.0-1, 3.0 | MG: 2.0, 5-6 SDAP: 1.1 MR: 1.0-2, 2.0-3, 5, 3.0-3 |
| 8. Make a Balloon Car | MG: 2.0 MR: 1.0-2, 2.0-1, 3.0 | MG: 2.0, 5-6 SDAP: 1.1 MR: 1.0-2, 2.0-3, 5, 3.0-3 |
| 9. Troubleshooting Balloon Cars | MG: 2.0 MR: 1.0-2, 2.0-1, 3.0 | MG: 2.0, 5-6 SDAP: 1.1 MR: 1.0-2, 2.0-3, 5, 3.0-3 |
| 10. How to Build a Balloon Car | MG: 2.0 | SDAP: 1.1 MR: 1.0-2 |
| 11. How a Balloon Car Works | MG: 2.0 MR: 1.0-2, 2.0-1, 3.0 | MG: 2.0, 5-6 SDAP: 1.1 MR: 1.0-2, 2.0-3, 5, 3.0-3 |
| 12. The Auto Show | | |
| Key | NS (Number Sense) MG (Measurement and Geometry) MR (Mathematical Reasoning) | NS (Number Sense) MG (Measurement and Geometry) SDAP (Statistics, Data Analysis and Probability) MR (Mathematical Reasoning) |

Full Description of Standards

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|---|
| California Mathematical Content Standards – Grade 2 |
| Measurement and Geometry |
| 2.0 Students identify and describe the attributes of common figures in the plane and of common objects in space: |
| Mathematical Reasoning |
| 1.0 Students make decisions about how to set up a problem: 1.1 Determine the approach, materials, and strategies to be used. 1.2 Use tools, such as manipulatives or sketches, to model problems. 2.0 Students solve problems and justify their reasoning: 2.1 Defend the reasoning used and justify the procedures selected. 3.0 Students note connections between one problem and another. |

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| California Mathematical Content Standards – Grade 3 |
| Measurement and Geometry |
| 2.0 Students describe and compare the attributes of plane and solid geometric figures and use their understanding to show relationships and solve problems: 2.5 Identify, describe, and classify common three-dimensional geometric objects (e.g., cube, rectangular solid, sphere, prism, pyramid, cone, cylinder). 2.6 Identify common solid objects that are the components needed to make a more complex solid object. |
| Statistics, Data Analysis, and Probability |
| 1.1 Identify whether common events are certain, likely, unlikely, or improbable. |
| 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: 2.1 Use estimation to verify the reasonableness of calculated results. 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. 2.5 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy. 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 Mathematics Standards
Physical Science Comes Alive Energy Systems for 2nd / 3rd grade (Fantastic Elastic)

| Lesson # | District of Columbia Mathematics Standards | |
|-------------------------------------|--|-----------------|
| | Grade 2 | Grade 3 |
| 1. What is a Wind-up? | G. 1,5 DASP. 1-3 | G. 2 DASP. 1 |
| 2. Make a Wind-up | G. 1,5 DASP. 1-3 | G. 2 DASP. 1 |
| 3. Troubleshooting Wind-ups | G. 1,5 DASP. 1-3 | G. 2 DASP. 1 |
| 4. How to Build a Wind-up | G. 1,5 DASP. 1-3 | G. 2 DASP. 1 |
| 5. Redesign your Wind-up | G. 1,5 DASP. 1-3 | G. 2 DASP. 1 |
| 6. How a Wind-up Works | G. 1,5 DASP. 1-3 | G. 2 DASP. 1 |
| 7. How could a Balloon Power a Car? | G. 1,5 DASP. 1-3 | G. 2 DASP. 1 |
| 8. Make a Balloon Car | G. 1,5 DASP. 1-3 | G. 2 DASP. 1 |
| 9. Troubleshooting Balloon Cars | G. 1,5 DASP. 1-3 | G. 2 DASP. 1 |
| 10. How to Build a Balloon Car | G. 1,5 DASP. 1-3 | G. 2 DASP. 1 |
| 11. How a Balloon Car Works | G. 1,5 DASP. 1-3 | G. 2 DASP. 1 |
| 12. The Auto Show | | |
| Key | NSO (Number Sense and Operations) -NSO-N (Number Sense) PRA (Patterns, Relations and Algebra) G (Geometry) M (Measurement) DASP (Data Analysis, Statistics and Probability) | |

Full Description of Standards

| District of Columbia Mathematics Standards – Grade 2 |
|---|
| Geometry |
| 2.G.1. Identify, describe, draw, and compare two-dimensional shapes, including both polygonal (up to six sides) and curved figures such as circles. 2.G.5. Predict and explain the results of putting two-dimensional shapes together and taking them apart (e.g., two congruent right triangular shapes form a rectangle). |
| Data Analysis, Statistics and Probability |
| 2.DASP.1. Use interviews, surveys, and observations to gather data about themselves and their surroundings. 2.DASP.2. Organize, classify, and represent data using tallies, charts, tables, bar graphs, pictographs, and Venn diagrams; interpret the representations. 2.DASP.3. Formulate inferences (draw conclusions) and make educated guesses (conjectures) about a situation based on information gained from data. |
| District of Columbia Mathematics Standards – Grade 3 |
| Geometry |
| 3.G.2. Describe, model, draw, compare, and classify three-dimensional and two-dimensional shapes, especially circles and polygons (e.g., triangles and quadrilaterals). |
| Data Analysis, Statistics and Probability |
| 3.DASP.1. Collect and organize data using observations, measurements, surveys, or experiments. |

Minnesota Academic Standards – Mathematics
Physical Science Comes Alive Energy Systems for 2nd / 3rd grade (Fantastic Elastic)

| Lesson # | Minnesota Academic Standards – Mathematics | |
|-------------------------------------|--|-----------|
| | Grade 2 | Grade 3 |
| 1. What is a Wind-up? | | GM: 3.1.2 |
| 2. Make a Wind-up | | GM: 3.1.2 |
| 3. Troubleshooting Wind-ups | | GM: 3.1.2 |
| 4. How to Build a Wind-up | | GM: 3.1.2 |
| 5. Redesign your Wind-up | | GM: 3.1.2 |
| 6. How a Wind-up Works | | GM: 3.1.2 |
| 7. How could a Balloon Power a Car? | | GM: 3.1.2 |
| 8. Make a Balloon Car | | GM: 3.1.2 |
| 9. Troubleshooting Balloon Cars | | GM: 3.1.2 |
| 10. How to Build a Balloon Car | | GM: 3.1.2 |
| 11. How a Balloon Car Works | | GM: 3.1.2 |
| 12. The Auto Show | | |
| Key | GM (Geometry and Measurement) | |

Full Description of Standards

| Minnesota Academic Standards – Mathematics – Grade 3 | | | |
|--|---|---------|---|
| Strand | Standard | No. | Benchmark |
| Geometry & Measurement | Use geometric attributes to describe and create shapes in various contexts. | 3.3.1.2 | Sketch polygons with a given number of sides or vertices (corners), such as pentagons, hexagons and octagons. |

NY State Learning Standards for Mathematics
Physical Science Comes Alive Energy Systems for 2nd / 3rd grade (Fantastic Elastic)

| Lesson # | NY State Learning Standards for Mathematics | |
|--|--|----------------------------|
| | Grade 2 | Grade 3 |
| 1. How a Balloon Car Works | PS: 1-3, 6-10 G: 3 | PS: 1-19 G: 1 S: 1-2 |
| 2. The Auto Show | PS: 1-3, 6-10 G: 3 | PS: 1-19 G: 1 S: 1-2 |
| 3. How a Balloon Car Works | PS: 1-3, 6-10 G: 3 | PS: 1-19 G: 1 S: 1-2 |
| 4. The Auto Show | PS: 1-3, 6-10 G: 3 | PS: 1-19 G: 1 S: 1-2 |
| 5. How a Balloon Car Works | PS: 1-3, 6-10 G: 3 | PS: 1-19 G: 1 S: 1-2 |
| 6. The Auto Show | PS: 1-3, 6-10 G: 3 | PS: 1-19 G: 1 S: 1-2 |
| 7. How a Balloon Car Works | PS: 1-3, 6-10 G: 3 | PS: 1-19 G: 1 S: 1-2 |
| 8. Make a Balloon Car | PS: 1-3, 6-10 G: 3 | PS: 1-19 G: 1 S: 1-2 |
| 9. Troubleshooting Balloon Cars | PS: 1-3, 6-10 G: 3 | PS: 1-19 G: 1 S: 1-2 |
| 10. How to Build a Balloon Car | PS: 1-3, 6-10 G: 3 | PS: 1-19 G: 1 S: 1-2 |
| 11. How a Balloon Car Works | PS: 1-3, 6-10 G: 3 | PS: 1-19 G: 1 S: 1-2 |
| 12. The Auto Show | | |
| Key | PS (Problem Solving) G (Geometry) S (Statistics and Probability) | |

Full Description of Standards

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|---|
| NY State Learning Standards for Mathematics – Grade 2 |
| Problem Solving |
| 2.PS.1 Explore, examine, and make observations about a social problem or mathematical situation 2.PS.2 Interpret information correctly, identify the problem, and generate possible solutions 2.PS.3 Act out or model with manipulatives activities involving mathematical content from literature and/or story telling 2.PS.6 Experience teacher-directed questioning process to understand problems 2.PS.7 Compare and discuss ideas for solving a problem with teacher and/or students to justify their thinking 2.PS.8 Use manipulatives (e.g., tiles, blocks) to model the action in problems 2.PS.9 Use drawings/pictures to model the action in problems 2.PS.10 Explain to others how a problem was solved, giving strategies and justifications |
| Geometry |
| 2.G.3 Compose (put together) and decompose (break apart) two-dimensional shapes |
| NY State Learning Standards for Mathematics – Grade 3 |
| Problem Solving |
| 3.PS.1 Explore, examine, and make observations about a social problem or mathematical situation 3.PS.2 Understand that some ways of representing a problem are more helpful than others 3.PS.3 Interpret information correctly, identify the problem, and generate possible solutions 3.PS.4 Act out or model with manipulatives activities involving mathematical content from literature 3.PS.5 Formulate problems and solutions from everyday situations 3.PS.6 Translate from a picture/diagram to a numeric expression 3.PS.7 Represent problem situations in oral, written, concrete, pictorial, and graphical forms 3.PS.8 Select an appropriate representation of a problem 3.PS.9 Use trial and error to solve problems 3.PS.10 Use process of elimination to solve problems 3.PS.11 Make pictures/diagrams of problems 3.PS.12 Use physical objects to model problems 3.PS.13 Work in collaboration with others to solve problems 3.PS.14 Make organized lists to solve numerical problems 3.PS.15 Make charts to solve numerical problems 3.PS.16 Analyze problems by identifying relationships 3.PS.17 Analyze problems by identifying relevant versus irrelevant information 3.PS.18 Analyze problems by observing patterns 3.PS.19 State a problem in their own words |
| Geometry |
| 3.G.1 Define and use correct terminology when referring to shapes(circle, triangle, square, rectangle, rhombus, trapezoid, and hexagon) |
| Statistics and Probability |
| 3.S.1 Formulate questions about themselves and their surroundings 3.S.2 Collect data using observation and surveys, and record appropriately |