CreositySpace – Draft Dodgers

Activity Descriptions and Standards Alignment

General Activity Descriptions:

Below you will find brief descriptions of the hands-on activities associated with the ***Draft Dodgers*** Technology Entrepreneurship Curriculum module. The activities assume you have access to a compute or laptop Google Chrome Browser. If you would like to check your computer's compatibility, please email us at kath@creosityspace.com

The main cost associated with the activities are the components needed to build and modify the model cars. To keep costs low students can bring in their own toy cars and use available art supplies.

Activity 1: Off to the races – Part 1

Objective:

To demonstrate how drag can impact the speed of a car

Materials:

Cars, car modifiers, ramp, fan

General Description:

Groups will work together to try to make the **MOST aerodynamic** car possible (all starting with the same framework and using the materials provided). A standard weight will be added to each car so that they are all about the same mass. Cars will be raced down a ramp and the cars that go the farthest distance will be awarded the title of the most aerodynamic.

Activity 2: Off to the races – Part 2

Objective:

To demonstrate how drag can impact the speed of a car

Materials:

Cars, car modifiers, ramp, fan

General Description:

Groups will work together to try to make the **LEAST aerodynamic** car possible (all starting with the same framework and using the materials provided). A standard weight will be added to each car so that they are all about the same mass. Cars will be raced down a ramp and the cars that go the shortest distance will be awarded the title of the most aerodynamic.

Education Standards Supported

Don't see the standards for your school district? Contact us at Kath@CreositySpace.com and we will determine the appropriate standards alignment for your district.

Common Core ELA Standards

Grade 3

Reading Informational Text:

CCSS.ELA-LITERACY.RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
CCSS.ELA-LITERACY.RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.
CCSS.ELA-LITERACY.RI.3.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 3 topic or subject area*.

Writing:

CCSS.ELA-Literacy.W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
CCSS.ELA-Literacy.W.3.2.a Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.
CCSS.ELA-Literacy.W.3.2.b Develop the topic with facts, definitions, and details.
CCSS.ELA-Literacy.W.3.2.c Use linking words and phrases (e.g., *also*, *another*, *and*, *more*, *but*) to connect ideas within categories of information.
CCSS.ELA-Literacy.W.3.2.d Provide a concluding statement or section.
CCSS.ELA-Literacy.W.3.1 Write opinion pieces on topics or texts, supporting a point of view with reasons.
CCSS.ELA-Literacy.W.3.1.a Introduce the topic or text they are writing about, state an opinion, and create an organizational structure that lists reasons.
CCSS.ELA-Literacy.W.3.1.b Provide reasons that support the opinion.
CCSS.ELA-Literacy.W.3.1.c Use linking words and phrases (e.g., *because*, *therefore*, *since*, *for example*) to connect opinion and reasons.
CCSS.ELA-Literacy.W.3.1.d Provide a concluding statement or section.
CCSS.ELA-Literacy.W.3.4 With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. (Grade-specific expectations for writing types are defined in standards 1-3 above.)
CCSS.ELA-Literacy.W.3.5 With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.
CCSS.ELA-Literacy.W.3.6 With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.
CCSS.ELA-Literacy.W.3.7 Conduct short research projects that build knowledge about a topic.
CCSS.ELA-Literacy.W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

Speaking & Listening:

CCSS.ELA-LITERACY.SL.3.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.
CCSS.ELA-LITERACY.SL.3.1.A Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
CCSS.ELA-LITERACY.SL.3.1.B Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
CCSS.ELA-Literacy.SL.3.1.c Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.
CCSS.ELA-Literacy.SL.3.1.d Explain their own ideas and understanding in light of the discussion.
CCSS.ELA-Literacy.SL.3.3 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
CCSS.ELA-Literacy.SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
CCSS.ELA-Literacy.SL.3.6 Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

Language:

CCSS.ELA-LITERACY.L.3.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
CCSS.ELA-LITERACY.L.3.1.A Explain the function of nouns, pronouns, verbs, adjectives, and adverbs in general and their functions in particular sentences.
CCSS.ELA-LITERACY.L.3.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
CCSS.ELA-LITERACY.L.3.4 Determine or clarify the meaning of unknown and multiple-meaning word and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.

Grade 4

Reading Informational Text:

CCSS.ELA-LITERACY.RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
CCSS.ELA-LITERACY.RI.4.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.
CCSS.ELA-LITERACY.RI.4.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.
CCSS.ELA-LITERACY.RI.4.5 Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.
CCSS.ELA-LITERACY.RI.4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

Writing:

CCSS.ELA-LITERACY.W.4.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
CCSS.ELA-LITERACY.W.4.1.A Introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer's purpose.
CCSS.ELA-LITERACY.W.4.1.B Provide reasons that are supported by facts and details.
CCSS.ELA-LITERACY.W.4.1.C Link opinion and reasons using words and phrases
CCSS.ELA-LITERACY.W.4.1.D Provide a concluding statement or section related to the opinion presented.
CCSS.ELA-LITERACY.W.4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
CCSS.ELA-LITERACY.W.4.2.A Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.
CCSS.ELA-LITERACY.W.4.2.B Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.
CCSS.ELA-LITERACY.W.4.2.C Link ideas within categories of information using words and phrases.
CCSS.ELA-LITERACY.W.4.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.
CCSS.ELA-LITERACY.W.4.2.E Provide a concluding statement or section related to the information or explanation presented.
CCSS.ELA-LITERACY.W.4.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
CCSS.ELA-LITERACY.W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

Speaking & Listening:

CCSS.ELA-LITERACY.SL.4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.
CCSS.ELA-LITERACY.SL.4.1.A Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
CCSS.ELA-LITERACY.SL.4.1.B Follow agreed-upon rules for discussions and carry out assigned roles.
CCSS.ELA-LITERACY.SL.4.1.C Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
CCSS.ELA-LITERACY.SL.4.1.D Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
CCSS.ELA-LITERACY.SL.4.3 Identify the reasons and evidence a speaker provides to support particular points.

Language:

CCSS.ELA-LITERACY.L.4.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
CCSS.ELA-LITERACY.L.4.1.A Use relative pronouns (*who, whose, whom, which, that*) and relative adverbs (*where, when, why*).
CCSS.ELA-LITERACY.L.4.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
CCSS.ELA-LITERACY.L.4.3 Use knowledge of language and its conventions when writing, speaking, reading, or listening.
CCSS.ELA-LITERACY.L.4.3.A Choose words and phrases to convey ideas precisely.
CCSS.ELA-LITERACY.L.4.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.

Grade 5

Reading Informational Text:

CCSS.ELA-LITERACY.RI.5.2 Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
CCSS.ELA-LITERACY.RI.5.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
CCSS.ELA-LITERACY.RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 5 topic or subject area*.

Writing:

CCSS.ELA-LITERACY.W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
CCSS.ELA-LITERACY.W.5.1.A Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose.
CCSS.ELA-LITERACY.W.5.1.B Provide logically ordered reasons that are supported by facts and details.
CCSS.ELA-LITERACY.W.5.1.C Link opinion and reasons using words, phrases, and clauses
CCSS.ELA-LITERACY.W.5.1.D Provide a concluding statement or section related to the opinion presented.
CCSS.ELA-LITERACY.W.5.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
CCSS.ELA-LITERACY.W.5.2.A Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.
CCSS.ELA-LITERACY.W.5.2.B Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.
CCSS.ELA-LITERACY.W.5.2.C Link ideas within and across categories of information using words, phrases, and clauses (e.g., *in contrast*, *especially*).
CCSS.ELA-LITERACY.W.5.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.
CCSS.ELA-LITERACY.W.5.2.E Provide a concluding statement or section related to the information or explanation presented.

CCSS.ELA-LITERACY.W.5.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
CCSS.ELA-LITERACY.W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

Speaking & Listening:

CCSS.ELA-LITERACY.SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.
CCSS.ELA-LITERACY.SL.5.1.A Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
CCSS.ELA-LITERACY.SL.5.1.B Follow agreed-upon rules for discussions and carry out assigned roles.
CCSS.ELA-LITERACY.SL.5.1.C Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
CCSS.ELA-LITERACY.SL.5.1.D Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.
CCSS.ELA-LITERACY.SL.5.3 Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.

Language:

CCSS.ELA-LITERACY.L.5.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
CCSS.ELA-LITERACY.L.5.1.A Explain the function of conjunctions, prepositions, and interjections in general and their function in particular sentences.
CCSS.ELA-LITERACY.L.5.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
CCSS.ELA-LITERACY.L.5.3 Use knowledge of language and its conventions when writing, speaking, reading, or listening.
CCSS.ELA-LITERACY.L.5.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.

Common Core Math Standards

Grade 3

MP.1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.

MP.6 Attend to precision.

3.OA.1-4 Represent and solve problems involving multiplication and division.

3.OA.5-6 Understand properties of multiplication and the relationship between multiplication and division.

3.OA.7 Multiply and divide within 100.

3.NBT.1 Use place value understanding and properties of operations to perform multi-digit arithmetic.

3.MD.3-4 Represent and interpret data.

Grade 4

MP.1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.

MP.6 Attend to precision.

4.OA.1-3 Use the four operations with whole numbers to solve problems.

4.OA.5 Gain familiarity with factors and multiples.

4.NBT.4-5 Use place value understanding and properties of operations to perform multi-digit arithmetic.

4.MD.4 Represent and interpret data.

4.G.3 Draw and identify lines and angles, and classify shapes by properties of their lines and angle.

Grade 5

MP.1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.

MP.6 Attend to precision.

5.MD.2 Represent and interpret data.

5.MD.1-2 Graph points on the coordinate plane to solve real-world and mathematical problems.

Next Generation Science Standards/NY State Learning Standards Grades 3 – 5

Performance Expectations

3-PS2-1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.
4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another

5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Example NGSS "Big Idea" and Topic Bundle: How is energy transferred between an object and its surroundings? (3-PS2-1, 4-PS3-2, 4-PS3-4, 5-PS1-1) In this bundle the abstract concept that energy transfer is introduced along the idea that this transfer of energy can be helpful or harmful.

Science and Engineering Practices

Asking questions / defining problems Constructing explanations/designing solutions;
The activity focuses on defining a problem and then constructing a solution

Developing and using models
The small scale cars are a model for real life transportation challenges.

Obtaining, evaluating, and communicating information
The writing and speaking challenges throughout the unit require students to learn new things and then communicate their findings to a larger audience.

Connections to Nature of Science

Scientific investigations use a variety of methods; Scientific knowledge is based on empirical evidence
Entrepreneur story/presentation and hands on activities illustrate how scientific investigations are conducted and how that information is put to use.

Disciplinary Core Ideas

LS1.A Structure and function

PS1.A Structure of matter
PS2.A Forces and motion
PS2.B Types of interactions
PS3.A Definitions of energy
PS3.B Conservation of energy and energy transfer
PS3.C Relationship between energy and forces
PS4.A Wave properties

ETS1.A: Defining and Delimiting Engineering Problems
ETS1.B: Developing Possible Solutions
ETS1.C: Optimizing the Design Solution

Cross Cutting Concepts

Cause and effect; Systems and system models
The activities bring to life both cause and effect as well as the use of models.

Energy and matter: Flows, cycles, and conservation
Discussions around potential energy, drag, friction and kinetic energy highlight energy transfer, conversion and conservation.

Structure and function
The design element of the activity has students thinking about structure and function.

Connections to Nature of Science

Science is a way of knowing; Science addresses questions about the natural and material world
Activities give firsthand experience in questioning, observing and concluding.

Science is a human endeavor
Entrepreneur story and historical timeline highlight the human aspect of science and engineering.

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology; Influence of Engineering, Technology and Science on Society and the Natural World
Introduction text, historical timeline and entrepreneur story highlight above interactions and interdependencies.

Connections to Common Core State Standards
See previous Common Core Standards section for ELA and Math standards addressed by these activities.

NY State Science Standards

Grade 3 & 4

STANDARD 1 - SCIENTIFIC INQUIRY:
S1.1 Ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.
S3.2 Interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.

STANDARD 1 - ENGINEERING DESIGN:
T1.1 Describe objects, imaginary or real, that might be modeled or made differently and suggest ways in which the objects can be changed, fixed, or improved.
T1.3 Generate ideas for possible solutions, individually and through group activity; apply age-appropriate mathematics and science skills; evaluate the ideas and determine the best solution; and explain reasons for the choices.
T1.4 Plan and build, under supervision, a model of the solution, using familiar materials, processes, and hand tools.
T1.5 Discuss how best to test the solution; perform the test under teacher supervision; record and portray results through numerical and graphic means; discuss orally why things worked or didn't work; and summarize results in writing, suggesting ways to make the solution better

STANDARD 6 – INTERCONNECTEDNESS:
Models - *Key Idea 2:* Models are simplified representations of objects, structures, or systems, used in analysis, explanation, or design.
Optimization - *Key Idea 6:* In order to arrive at the best solution that meets criteria within constraints, it is often necessary to make trade-offs.

SCIENCE STANDARD - PHYSICAL SETTING:
3.1a Matter takes up space and has mass. Two objects cannot occupy the same place at the same time.
3.1b Matter has properties (color, hardness, odor, sound, taste, etc.) that can be observed through the senses.
3.1c Objects have properties that can be observed, described, and/or measured: length, width, volume, size, shape, mass or weight, temperature, texture, flexibility, reflectiveness of light.
3.2a Matter exists in three states: solid, liquid, gas.
4.1b Energy can be transferred from one place to another.
5.1f Mechanical energy may cause change in motion through the application of force and through the use of simple machines such as pulleys, levers, and inclined planes.

Grade 5

STANDARD 1 SCIENTIFIC INQUIRY:
S2.1 Use conventional techniques and those of their own design to make further observations and refine their explanations, guided by a need for more information.
S2.1a demonstrate appropriate safety techniques
S2.1b conduct an experiment designed by others
S2.1c design and conduct an experiment to test a hypothesis
S2.1d use appropriate tools and conventional techniques to solve problems about the natural world, including: measuring, observing, and describing.
S3.2 Interpret the organized data to answer the research question or hypothesis and to gain insight into the problem.

STANDARD 1 ENGINEERING DESIGN:
T1.1 Identify needs and opportunities for technical solutions from an investigation of situations of general or social interest.
T1.1a identify a scientific or human need that is subject to a technological solution which applies scientific principles
T1.3 Consider constraints and generate several ideas for alternative solutions, using group and individual ideation techniques (group discussion, brainstorming, forced connections, role play); defer judgment until a number of ideas have been generated; evaluate (critique) ideas; and explain why the chosen solution is optimal.
T1.3a generate ideas for alternative solutions

STANDARD 6 INTERCONNECTEDNESS
Systems Thinking -*Key Idea 1:* Through systems thinking, people can recognize the commonalities that exist among all systems and how parts of a system interrelate and combine to perform specific functions.
Models *Key Idea 2:* Models are simplified representations of objects, structures, or systems, used in analysis, explanation, or design.
Magnitude and Scale *Key Idea 3*: The grouping of magnitudes of size, time, frequency, and pressures or other units of measurement into a series of relative order provides a useful way to deal with the immense range and the changes in scale that affect the behavior and design of systems.

STANDARD 4 –Science - Physical Setting:
3.1a Substances have characteristic properties. Some of these properties include color, odor, phase at room temperature, density, solubility, heat and electrical conductivity, hardness, and boiling and freezing points.
3.1c The motion of particles helps to explain the phases (states) of matter as well as changes from one phase to another. The phase in which matter exists depends on the attractive forces among its particles.
3.1g Characteristic properties can be used to identify different materials, and separate a mixture of substances into its components. For example, iron can be removed from a mixture by means of a magnet. An insoluble substance can be separated from a soluble substance by such processes as filtration, settling, and evaporation.
3.3a All matter is made up of atoms. Atoms are far too small to see with a light microscope.

Texas Essential Knowledge and Skills

General

(1) Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following school and home safety procedures and environmentally appropriate practices. The student is expected to:

(A) demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including observing a schoolyard habitat; and

(B) make informed choices in the use and conservation of natural resources by recycling or reusing materials such as paper, aluminum cans, and plastics.

(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to:

(A) plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world;

(B) collect data by observing

(D) analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations;

(F) communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion.

(3) Scientific investigation and reasoning. The student knows that information, critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions. The student is expected to:

(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;

(D) connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.

Grade 3

(6) Force, motion, and energy. The student knows that forces cause change and that energy exists in many forms. The student is expected to:

(A) explore different forms of energy, including mechanical, light, sound, and heat/thermal in everyday life

(B) demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons; and

(C) observe forces such as magnetism and gravity acting on objects.

Grade 4

(6) Force, motion, and energy. The student knows that energy exists in many forms and can be observed in cycles, patterns, and systems. The student is expected to:

(A) differentiate among forms of energy, including mechanical, sound, electrical, light, and heat/thermal;

(D) design an experiment to test the effect of force on an object such as a push or a pull, gravity, friction, or magnetism.

Grade 5

(6) Force, motion, and energy. The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to:

(A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy;

(D) design an experiment that tests the effect of force on an object.