

## Fifth Grade Standards Connections for Labs

Physics of Roller Coasters	Advanced Physics of Roller Coasters	Chemicals of Innovation	Down the Drain	Engineering for Earthquakes	Simplicity of Electricity	Chemistry of Platination	DNA and Genetics
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Next Generation Science Standards		Physics of Roller Coasters	Advanced Physics of Roller Coasters	Chemicals of Innovation	Down the Drain	Engineering for Earthquakes	Simplicity of Electricity	Chemistry of Platination	DNA and Genetics
<b>Engineering Design</b>									
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.	✓			✓	✓	✓		
3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	✓		✓	✓	✓	✓		
<b>Physical Sciences</b>									
5-PS1-2	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.			✓					
5-PS1-3	Make observations and measurements to identify materials based on their properties.			✓					
5-PS1-4	Conduct an investigation to determine whether the mixing of two or more substances results in new substances.			✓					
5-PS2-1	Support an argument that the gravitational force exerted by Earth on objects is directed down.	✓							
<b>Earth and Space Sciences</b>									
5-ESS3-1	Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.				✓				
<b>Science and Engineering Practices</b>									
Practice 1	Asking questions and defining problems	✓		✓	✓	✓	✓		
Practice 2	Developing and using models	✓		✓	✓	✓	✓		
Practice 3	Planning and carrying out investigations	✓		✓	✓	✓	✓		
Practice 6	Constructing explanations and designing solutions	✓		✓	✓	✓	✓		
Practice 7	Engaging in argument from evidence			✓	✓				
Practice 8	Obtaining, evaluating, and communicating information			✓	✓				
<b>Disciplinary Core Ideas</b>									
ESS2.A	<i>Earth Materials and Systems</i> •Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (ice), and the biosphere (living things). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate.				✓				
ESS2.C	<i>The Roles of Water in Earth's Surface Processes</i> • Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.				✓				

ESS3.C	<i>Human Impacts on Earth Systems</i> • Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.				✓				
PS1.A	<i>Structure and Properties of Matter</i> • Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model shows that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects. • The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. • Measurements of a variety of properties can be used to identify materials.			✓					
PS1.B	<i>Chemical Reactions</i> • When two or more different substances are mixed, a new substance with different properties may be formed. • No matter what reaction or change in properties occurs, the total weight of the substances does not change.			✓					
PS2.B	<i>Types of Interactions</i> • The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.	✓							
ETS1.A	<i>Defining and Delimiting an Engineering Problem</i> • Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.	✓				✓	✓		
ETS1.B	<i>Developing Possible Solutions</i> • At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. • Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. • Testing a solution involves investigating how well it performs under a range of likely conditions.	✓				✓	✓		
ETS1.C	<i>Optimizing the Design Solution</i> • Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.	✓				✓	✓		
<b>Crosscutting Concepts</b>									
Cause and Effect	Cause and effect relationships are routinely identified, tested, and used to explain change.	✓		✓					
Scale, Proportion, and Quantity	• Natural objects exist from the very small to the immensely large. • Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.			✓					
Energy and Matter	• Energy can be transferred in various ways and between objects • Matter is transported into, out of, and within systems	✓		✓					
Systems and System Models	A system can be described in terms of its components and their interactions.			✓	✓		✓		
Influence of Engineering, Technology, and Science on Society and the Natural World	Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.				✓	✓	✓		

## Common Core Language Arts

### Speaking and Listening

SL.5.1	Engage effectively in a range of collaborative discussions with diverse partners on Grade 5 topics and texts, building on others' ideas and expressing their own clearly.	✓		✓	✓	✓	✓		
SL.5.1b	Follow agreed-upon rules for discussions and carry out assigned roles.	✓		✓	✓	✓	✓		
SL.5.1c	Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.	✓		✓	✓	✓	✓		
SL.5.1d	Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.	✓		✓	✓	✓	✓		
SL.5.4	Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.	✓		✓	✓	✓	✓		



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