| Pushing the Envelope | | | |
|---|---|---|---|
| 2010 Science | | | |
| Standards of Learning | | | |
| **Virginia Science** | | | |
| **Grade 5** | | | |
| **Activity/Lesson** | **State** | **Standards** | |
| Chemistry (pgs. 25-41) | VA | SCI.5.5.1.b | The student will understand that estimates are made and accurate measurements of length, mass, volume, and temperature are made in metric units using proper tools; |
| Chemistry (pgs. 25-41) | VA | SCI.5.5.4.a | The student will investigate and understand that matter is anything that has mass and takes up space; and occurs as a solid, liquid, or gas. Key concepts include distinguishing properties of each phase of matter; |
| | | | |

| Pushing the Envelope | | | |
|---|---|---|---|
| 2010 Science | | | |
| Standards of Learning | | | |
| **Virginia Science** | | | |
| **Grade 6** | | | |
| **Activity/Lesson** | **State** | **Standards** | |
| Types of Engines ( pgs. 11-23) | VA | SCI.6.6.1.c | The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which scale models are used to estimate distance, volume, and quantity; |
| Chemistry (pgs. 25-41) | VA | SCI.6.6.4.e | The student will understand that compounds may be represented by chemical formulas; |
| Chemistry (pgs. 25-41) | VA | SCI.6.6.4.f | The student will understand that chemical equations can be used to model chemical changes; |
| | | | |

| Pushing the Envelope | | | |
|---|---|---|---|
| 2010 Science | | | |
| Standards of Learning | | | |
| **Virginia Science** | | | |
| **Grades 7-8 (Physical Science)** | | | |
| **Activity/Lesson** | **State** | **Standards** | |
| Types of Engines ( pgs. 11-23) | VA | SCI.7-8.PS.10.a | The student will investigate and understand the scientific principles of work, force, and motion. Key concepts include speed, velocity, and acceleration; |
| Chemistry (pgs. 25-41) | VA | SCI.7-8.PS.2.d | The student will investigate and understand the nature of matter. Key concepts include physical properties; |
| Chemistry (pgs. 25-41) | VA | SCI.7-8.PS.2.e | The student will investigate and understand the nature of matter. Key concepts include chemical properties |
| Physics and Math (pgs. 43-63) | VA | SCI.7-8.PS.10.b | The student will investigate and understand the scientific principles of work, force, and motion. Key concepts include Newton's laws of motion; |

| | | | |
|---|---|---|---|
| Physics and Math (pgs. 43-63) | VA | SCI.7-8.PS.10.d | The student will investigate and understand the scientific principles of work, force, and motion. Key concepts include technological applications of work, force, and motion. |
| Rocket Activity (pgs. 69-75) | VA | SCI.7-8.PS.10.b | The student will investigate and understand the scientific principles of work, force, and motion. Key concepts include Newton's laws of motion; |
| Rocket Activity (pgs. 69-75) | VA | SCI.7-8.PS.10.c | The student will investigate and understand the scientific principles of work, force, and motion. Key concepts include work, force, mechanical advantage, efficiency, and power; |
| Rocket Activity (pgs. 69-75) | VA | SCI.7-8.PS.10.d | The student will investigate and understand the scientific principles of work, force, and motion. Key concepts include technological applications of work, force, and motion. |
| | | | |
| **Pushing the Envelope** | | | |
| **2010 Science** | | | |
| **Standards of Learning** | | | |
| **Virginia Science** | | | |
| **Grades 9-12 (Physics)** | | | |
| **Activity/Lesson** | **State** | **Standards** | |
| History of Aviation Propulsion (pgs. 5-9) | VA | SCI.9-12.PH.5.d | The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include Newton's laws of motion; |
| History of Aviation Propulsion (pgs. 5-9) | VA | SCI.9-12.PH.5.g | The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include work, power, and energy. |
| Chemistry (pgs. 25-41) | VA | SCI.9-12.PH.12.b | The student will investigate and understand that extremely large and extremely small quantities are not necessarily described by the same laws as those studied in Newtonian physics. Key concepts may include wave properties of matter; |
| Chemistry (pgs. 25-41) | VA | SCI.9-12.PH.12.g | The student will investigate and understand that extremely large and extremely small quantities are not necessarily described by the same laws as those studied in Newtonian physics. Key concepts may include solid state physics; |
| Physics and Math (pgs. 43-63) | VA | SCI.9-12.PH.5.a | The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include linear motion; |

| | | | |
|---|---|---|---|
| Physics and Math (pgs. 43-63) | VA | SCI.9-12.PH.5.c | The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include projectile motion; |
| Physics and Math (pgs. 43-63) | VA | SCI.9-12.PH.5.d | The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include Newton's laws of motion; |
| Physics and Math (pgs. 43-63) | VA | SCI.9-12.PH.5.g | The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include work, power, and energy. |
| Rocket Activity (pgs. 69-75) | VA | SCI.9-12.PH.5.a | The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include linear motion; |
| Rocket Activity (pgs. 69-75) | VA | SCI.9-12.PH.5.c | The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include projectile motion; |
| Rocket Activity (pgs. 69-75) | VA | SCI.9-12.PH.5.d | The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include Newton's laws of motion; |
| Rocket Activity (pgs. 69-75) | VA | SCI.9-12.PH.5.g | The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include work, power, and energy. |