

Diocese of Green Bay  
SCIENCE

In science students learn through natural curiosity about the world God created for us. Students have the privilege of learning about God's creation from a Catholic perspective leading to responsible stewardship and ultimate respect and love for the Creator. The study of God's creation and how we interact with the world, emphasizes the dignity and sacredness of life in all forms. Students learn to take responsibility for their actions and to be good stewards of God's creation. ...

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Beth Southard	Holy Spirit	Appleton
Rachel Cohen	St. Francis of Assisi	Manitowoc
Judy Belanger	St. Bernard	Green Bay
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References

*Laudato Si'* Care for our Common Home

[http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco\\_20150524\\_enciclica-laudato-si.html](http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html)

Catechism of the Catholic Church

Baglow, C.T. (2012). Faith, Science and Reason: Theology on the Cutting Edge. Midwest Theological Forum. Woodridge, IL  
Archdiocese of Milwaukee, Wisconsin

Diocese of Madison, Wisconsin

Diocese of La Crosse, Wisconsin

Diocese of Columbus, Ohio

A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. National Research Council of the  
National Academies. The National Academies Press. Washington, D.C. (2012)

Next Generation Science Standards

**Science as Inquiry**  
**Sixth Grade, Seventh Grade, Eighth Grade**

Students who demonstrate understanding:

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| <ol style="list-style-type: none"><li>1. Investigate contributions to the advancement of science made by people in the Catholic church, different cultures, and at different times in history.</li><li>2. Apply Catholic values, morals and ethics to the development and application of science concepts.</li><li>3. Trace the development of an invention, theory, or discovery to demonstrate the dynamic nature of science.</li><li>4. Observe and ask questions about the natural world God Created.</li><li>5. Plan and conduct simple investigations individually and with a team.</li></ol> | <ol style="list-style-type: none"><li>6. Employ simple equipment and tools to gather data and extend the senses.</li><li>7. Use appropriate mathematics with data to construct reasonable explanations.</li><li>8. Communicate about observations, investigations and explanations.</li><li>9. Review and ask questions about the observations and explanations of others.</li><li>10. Work in collaboration with others on scientific investigations.</li></ol> |
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Physical Science  
Sixth Grade, Seventh Grade, Eighth Grade

**1. Matter and its Interactions (MI)**

Students who demonstrate understanding:

**Structure and Properties of Matter (SP)**

1. Understand all earth's substances come from God.
2. Understand substances are made from different types of atoms, which combine with one another in various ways.
3. Examine, describe, compare, measure, and classify objects based on physical and chemical properties.
4. Classify and describe matter in terms of elements, compounds, mixtures, atoms and molecules.
5. Identify pure substances; their physical and chemical properties.
6. Demonstrate how atoms form molecules that range in size from two to thousands of atoms.
7. Understand solids may be formed from molecules, or may be extended structures with repeating subunits (e.g., crystals).
8. Develop models to describe the atomic composition of simple molecules and extended structures (NGSS PS1-1).
9. Identify gases and liquids as made of molecules or inert atoms moving about relative to each other.
10. Develop a model, drawing, diagram that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

**Chemical Reactions (CR)**

1. Describe how substances react chemically in characteristic ways.
2. Describe a chemical process (atoms are regrouped into different molecules).
3. Compare and contrast the properties of an original substance and the new substance following a chemical process.
4. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved (NGSS PS1-5).
5. Demonstrates understanding of the Law of Conservation of Matter.

<ol style="list-style-type: none"><li>11. Understand each pure substance has characteristic physical and chemical properties that can be used to identify it.</li><li>12. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred (NGSS PS1-2).</li><li>13. Understand synthetic materials come from natural resources.</li><li>14. Understand natural resources undergo a chemical process to form synthetic material.</li><li>15. Draw conclusions from information about how synthetic materials come from natural resources and their impact on society (NGSS PS1-3).</li></ol>	
<p><b>Energy (E)</b></p> <ol style="list-style-type: none"><li>1. Understand “heat” refers to both thermal energy and the transfer of that thermal energy from one object to another.</li><li>2. Describe qualitative and quantitative relationships of energy transfer and energy transformation using data, observations, and graphs.</li><li>3. Understand that adding or removing thermal energy to solids, liquids, or gases, increases or decreases kinetic energy of the particles until a change of state occurs.</li><li>4. Develop a model that predicts and describes changes in particular motion, temperature, and state of a pure substance when thermal energy is added or removed (NGSS PS1-4).</li><li>5. Design a project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes (NGSS PS1-6).</li></ol>	

## 2. Motion and Stability

Students who demonstrate understanding:

### **Forces and Interactions**

1. Identify and predict what will change and what will remain unchanged when matter experiences an external force or energy change
2. Understand for any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction (Newton's Third Law)
3. Design a solution to a problem involving the motion of two colliding objects (NGSS PS2-1)
4. Understand the motion of an object is determined by the sum of the forces acting on it. (NGSS PS2-2)
5. Understand examining changes over time and forces at different scales
6. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object (Newton's First Law) (NGSS PS2-2)