



NEW JERSEY
Core Curriculum Content Standards for Science Grade 6
Science Level Red © 2005

CONTENT STANDARDS	PAGE REFERENCES
Standard 5.1 (Scientific Processes) All students will develop problem-solving, decision-making and inquiry skills, reflected by formulating usable questions and hypotheses, planning experiments, conducting systematic observations, interpreting and analyzing data, drawing conclusions, and communicating results.	
Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:	
A. Habits of Mind	
1. Evaluate the strengths and weaknesses of data, claims, and arguments.	SE: 27-30 <i>Design Your Own Lab</i> 464-465, 488-489 <i>Science Skill Handbook</i> 678 TWE: D 28 VL 28 QD 29 CFU 30
2. Communicate experimental findings to others.	SE: <i>Communicating Your Data</i> 185, 217, 236, 245, 365, 431, 489, 551, 637 <i>Science Skill Handbook</i> 686
3. Recognize that the results of scientific investigations are seldom exactly the same and that replication is often necessary.	SE: 6-7, 12-20 <i>Design Your Own Lab</i> 60-61, 244-245, 636-637 <i>Science Skill Handbook</i> 678-686 TWE: SCB 4E-F D 29
4. Recognize that curiosity, skepticism, open-mindedness, and honesty are attributes of scientists.	SE: 6-7, 12-20, 27-30 <i>Science Skill Handbook</i> 686 TWE: SCB 4E-F
B. Inquiry and Problem Solving	
1. Identify questions and make predictions that can be addressed by conducting investigations.	SE: <i>Lab</i> 118-119, 216-217, 298, 654 <i>Design Your Own Lab</i> 244-245, 332-333, 520-521 <i>Model and Invent Lab</i> 306-307 TWE: LD 14 AIL 88
2. Design and conduct investigations incorporating the use of a control.	SE: <i>Design Your Own Lab</i> 88-89, 244-245, 332-333, 488-489, 520-521, 636-637 TWE: AIL 32, 88
3. Collect, organize, and interpret the data that result from experiments.	SE: <i>Lab</i> 32-33, 216-217, 298 <i>Design Your Own Lab</i> 60-61, 88-89, 244-245, 332-333, 364-365 <i>Model and Invent Lab</i> 306-307, 396-397

CONTENT STANDARDS	PAGE REFERENCES
C. Safety	
1. Know when and how to use appropriate safety equipment with all classroom materials.	SE: 19-20 <i>Science Skill Handbook</i> 687-689 TWE: D 19 VL 19
2. Understand and practice safety procedures for conducting science investigations.	SE: <i>Design Your Own Lab</i> 88-89, 332-333, 580-581, 636-637 <i>Lab</i> 118-119, 298, 379, 414 <i>Model and Invent Lab</i> 396-397 TWE: QD 71
Standard 5.2 (Science and Society) All students will develop an understanding of how people of various cultures have contributed to the advancement of science and technology, and how major discoveries and events have advanced science and technology.	
Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:	
A. Cultural Contributions	
1. Recognize that scientific theories: <ul style="list-style-type: none"> develop over time, depend on the contributions of many people, and reflect the social and political climate of their time. 	SE: 7, 26, 99-105 <i>Science and History</i> 90 TWE: CD 292 SCB 474E
2. Know that scientists are men and women of many cultures who often work together to solve scientific and technological problems.	SE: 9-11, 423-429 <i>National Geographic</i> 108 TWE: CD 166, 292
3. Describe how different people in different cultures have made and continue to make contributions to science and technology.	SE: 99-105 <i>Science and History</i> 34, 90, 120, 218, 582 TWE: CC 47 CD 75, 416 DI 104
B. Historical Perspectives	
1. Describe the impact of major events and people in the history of science and technology, in conjunction with other world events.	SE: <i>Accidents in Science</i> 280 TWE: D 90
2. Describe the development and exponential growth of scientific knowledge and technological innovations.	SE: 11, 415-422, 423-429, 476-477 <i>National Geographic</i> 142 TWE: T 404 CFU 481
Standard 5.3 (Mathematical Applications) All students will integrate mathematics as a tool for problem-solving in science, and as a means of expressing and/or modeling scientific theories.	
Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:	
A. Numerical Operations	
1. Express quantities using appropriate number formats, such as: <ul style="list-style-type: none"> decimals. percents. scientific notation. 	SE: 44-49 <i>Applying Math</i> 48, 65, 547 <i>Design Your Own Lab</i> 60-61, 332-333 <i>Math Skill Handbook</i> 705-719 TWE: ACT 28 DI 48

CONTENT STANDARDS	PAGE REFERENCES
B. Geometry and Measurement	
1. Perform mathematical computations using labeled quantities and express answers in correctly derived units.	SE: <i>Applying Math</i> 131, 132, 140, 143, 145, 353, 485 TWE: A 14 ACT 133 DI 164
C. Patterns and Algebra	
1. Express physical relationships in terms of mathematical equations derived from collected data.	SE: <i>Lab</i> 55 <i>Design Your Own Lab</i> 244-245 <i>Use the Internet Lab</i> 430-431 TWE: R 79, 135
D. Data Analysis and Probability	
1. Represent and describe mathematical relationships among variables using: <ul style="list-style-type: none"> • graphs. • tables. 	SE: <i>Lab</i> 32-33, 151, 184-185, 654 <i>Design Your Own Lab</i> 60-61, 636-637 <i>Applying Math</i> 416 TWE: LD 57 R 135
2. Analyze experimental data sets using measures of central tendency: <ul style="list-style-type: none"> • mean. • mode. • median. 	SE: <i>Applying Math</i> 17 <i>Design Your Own Lab</i> 244-245 <i>Math Skill Handbook</i> 711
3. Construct and use a graph of experimental data to draw a line of best fit and identify a linear relationship between variables.	SE: 189 #20 <i>Lab</i> 32-33, 151, 184-185 <i>Design Your Own Lab</i> 60-61 TWE: R 135
4. Use computer spreadsheets, graphing and database applications to assist in quantitative analysis of data.	SE: <i>Technology Skill Handbook</i> 701-704 TWE: CYD 33, 151, 153, 215, 245 IL 232
Standard 5.4 (Nature and Process of Technology) All students will understand the interrelationships between science and technology and develop a conceptual understanding of the nature and process of technology.	
Building upon knowledge and skills gained in preceding grades, by the end of Grade 6, students will:	
A. Science and Technology	
1. Distinguish between things that occur in nature and those that have been designed to solve human problems.	SE: 11
B. Nature of Technology	
1. Demonstrate how measuring instruments are used to gather information in order to design things that work properly.	SE: 42-49, 50-54 <i>MiniLAB</i> 44 <i>Design Your Own Lab</i> 364-365 TWE: IL 48 R 49
C. Technological Design	
1. Select a technological problem and describe the criteria and constraints and criteria that are addressed in solving the problem.	SE: <i>Design Your Own Lab</i> 364-365 <i>Lab</i> 414 TWE: T 127 IL 263

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2. Identify the basic components of a technological system: <ul style="list-style-type: none"> • input. • process. • output. • feedback. 	SE: <i>Design Your Own Lab</i> 364-365 <i>Lab</i> 414 TWE: T 127, 404
Standard 5.5 (Characteristics of Life) All students will gain an understanding of the structure, characteristics, and basic needs of organisms and will investigate the diversity of life.	
Building upon knowledge and skills gained in preceding grades, by the end of Grade 6, students will:	
A. Matter, Energy and Organization in Living Systems	
1. Explain how systems of the human body are interrelated and regulate the body's internal environment.	SE: 485-487, 560-572, 574-579 <i>Launch Lab</i> 559 <i>Science Online</i> 571 TWE: SCB 558E-F TPK 560 LD 562 MM 571 CFU 572
2. Identify and describe the structure and function of cells and cell parts.	SE: 478-481, 483-487 <i>Lab</i> 482 TWE: SCB 474E-F ACT 478 DI 485 CFU 487
B. Diversity and Biological Evolution	
1. Describe and give examples of the major categories of organisms and of the characteristics shared by organisms.	SE: 498-500, 501-505, 506-511, 512-518, 530-534, 535-539, 541-544, 545-549 <i>Launch Lab</i> 497 TWE: SCB 496E-F
2. Compare and contrast acquired and inherited characteristics in human and other species.	SE: 536, 539, 541-544 <i>MiniLAB</i> 546 TWE: VL 536, 541 ACT 538, 547 CFU 539
C. Reproduction and Heredity	
1. Describe life cycles of humans and other organisms.	SE: 513, 537, 577-579 <i>Lab</i> 519, 540 TWE: IL 513 A 519 DI 537 ACT 537 MM 578

CONTENT STANDARDS	PAGE REFERENCES
Standard 5.6 (Chemistry) All students will gain an understanding of the structure and behavior of matter.	
Building upon knowledge and skills gained in preceding grades, by the end of Grade 6, students will:	
A. Structure and Properties of Matter	
1. Recognize that about 100 different elements have been identified and most materials on Earth are made of a few of them.	SE: 261 <i>Lab</i> 112
2. Show that equal volumes of different substances usually have different masses.	SE: 73 <i>MiniLAB</i> 73 TWE: VL 73
3. Describe the properties of mixtures and solutions, including concentration and saturation.	SE: 113-117 TWE: DI 115 QD 116 CFU 117 R 117 A 117
4. Describe characteristic physical properties such as boiling point, melting point, and solubility, and recognize that the property is independent of the amount of sample.	SE: 70-79 TWE: LD 72 QD 75 D 75 ACT 77 DI 78
B. Chemical Reactions	
1. Recognize evidence of a chemical change.	SE: 80-86, 178-182 <i>MiniLAB</i> 84 <i>Applying Science</i> 85 TWE: QD 82 ACT 83 DI 83 SJ 83 R 86 A 89
Standard 5.7 (Physics) All students will gain an understanding of natural laws as they apply to motion, forces, and energy transformations.	
Building upon knowledge and skills gained in preceding grades, by the end of Grade 6, students will:	
A. Motion and Forces	
1. Recognize that an object at rest will remain at rest and an object moving in a straight line at a steady speed will continue to move in a straight line at a steady speed unless a net (unbalanced) force acts on it.	SE: 136-143 <i>Lab</i> 151 TWE: SCB 128E IM 128F
2. Recognize that motion can be retarded by forces such as friction and air resistance.	SE: 136-143 <i>Lab</i> 151 TWE: VL 139 TFYI 139 LD 141 DI 148

CONTENT STANDARDS	PAGE REFERENCES
3. Recognize that everything on or near the earth is pulled toward the earth's center by gravitational force.	SE: 136-143, 195, 203, 417 <i>Launch Lab</i> 5, 193 <i>Lab</i> 151 TWE: DI 148
B. Energy Transformations	
1. Recognize that heat flows through materials or across space from warmer objects to cooler ones.	SE: 170-177
2. Show that vibrations in materials can generate waves that can transfer energy from one place to another.	SE: 226-230, 231-235 <i>Launch Lab</i> 225 TWE: SCB 224E TPK 226, 231 D 227 MM 227 CFU 230 CB 246
3. Design an electric circuit to investigate the behavior of a system.	SE: 201-208 <i>Lab</i> 215 TWE: ACT 202 DI 202 MM 206 LD 207 CFU 208 A 215
Standard 5.8 (Earth Science) All students will gain an understanding of the structure, dynamics, and geophysical systems of the earth.	
Building upon knowledge and skills gained in preceding grades, by the end of Grade 6, students will:	
A. Earth's Properties and Materials	
1. Observe that most rocks and soils are made of several substances or minerals.	SE: 265-271, 272-276 <i>Integrate Earth Science</i> 117 <i>Launch Lab</i> 255 <i>MiniLAB</i> 270 TWE: SCB 254E-F TPK 265 ACT 266 MM 269 IM 314F
2. Observe that the properties of soil vary from place to place and will affect the soil's ability to support life.	SE: 320-321 <i>Lab</i> 322 <i>MiniLAB</i> 623 TWE: T 253 QD 321 R 321 A 322, 623
3. Recognize that fossils provide evidence about the plants and animals that lived long ago and the nature of the environment at that time.	SE: 271

CONTENT STANDARDS	PAGE REFERENCES
B. Atmosphere and Water	
1. Describe the composition, circulation, and distribution of the world's oceans, estuaries, and marine environments.	SE: 374-378, 380-384 <i>Launch Lab</i> 373 <i>Science Online</i> 381 <i>MiniLAB</i> 383 <i>Science Stats</i> 398 TWE: DI 346 QD 375 D 376 LD 382
2. Describe and illustrate the water cycle.	SE: 347 <i>National Geographic</i> 346 <i>MiniLAB</i> 347 TWE: ACT 345 DI 346 V 346 CFU 347 D 658
C. Processes that Shape the Earth	
1. Summarize the process involved in the rock cycle and describe the characteristics of the rocks involved.	SE: 265-271, 272-276 <i>Lab</i> 277 TWE: D 266 LD 266 TFYI 270 A 271 QD 274 VL 275 R 276
D. How We Study the Earth	
1. Utilize various tools such as map projections and topographical maps to interpret features of Earth's surface.	SE: <i>Science Online</i> 302 TWE: D 22 IL 232, 289 CFU 297
Standard 5.9 (Astronomy and Space Science) All students will gain an understanding of the origin, evolution, and structure of the universe.	
Building upon knowledge and skills gained in preceding grades, by the end of Grade 6, students will:	
A. Earth, Moon, Sun System	
1. Explain how the motions of the Earth, sun, and moon define units of time including: <ul style="list-style-type: none"> • days • months • years 	SE: 440-446 <i>Lab</i> 447 TWE: SCB 438E CFU 446
2. Recognize that changes in the Earth's position relative to the sun produces differing amounts of daylight seasonally.	SE: 441 <i>MiniLAB</i> 441 TWE: IM 441 R 446

CONTENT STANDARDS	PAGE REFERENCES
B. Solar System	
1. Using models, demonstrate an understanding of the scale of the solar system that shows distance and size relationships among the sun and planets.	SE: 448-455 <i>Applying Science</i> 453 TWE: UAA 443 MM 444 VL 449 R 455
2. Recognize that the sun's gravitational pull holds the planets in their orbits and that the planets' gravitational pull holds their moons in their orbits.	SE: 448-455
C. Stars	
1. Observe and record short-term and long-term changes in the positions of the constellations in the night sky.	SE: 456 TWE: TPK 456
2. Observe that the planets appear to change their position against the background of stars.	SE: <i>MiniLAB</i> 450
D. Galaxies and Universe	
1. Recognize that images of celestial objects can be magnified and seen in greater detail when observed using binoculars and light telescopes.	SE: 408-413 <i>Lab</i> 414 TWE: T 404 SCB 406E QD 410 SJ 411 CFU 413
2. Observe and record short-term and long-term changes in the night sky.	SE: <i>Use the Internet Lab</i> 430-431 <i>MiniLAB</i> 450 TWE: AIL 430 ACT 443
Standard 5.10 (Environmental Studies) All students will develop an understanding of the environment as a system of interdependent components affected by human activity and natural phenomena.	
Building upon knowledge and skills gained in preceding grades, by the end of Grade 6, students will:	
A. Natural Systems and Interactions	
1. Explain how organisms interact with other components of an ecosystem.	SE: 389-395, 618-625, 627-632, 633-635 <i>Launch Lab</i> 617 <i>Lab</i> 626 TWE: QD 8 VL 619 SJ 621 A 625
2. Describe the natural processes that occur over time in places where direct human impact is minimal.	SE: 316-321, 323-331 <i>Science Online</i> 181 <i>Science Stats</i> 246 TWE: D 318 DI 328

CONTENT STANDARDS	PAGE REFERENCES
B. Human Interactions and Impact	
1. Describe the effect of human activities on various ecosystems.	SE: 646-653, 655-662, 663-667 <i>Applying Science</i> 392, 510, 665 <i>Integrate Social Studies</i> 507 TWE: CD 508, 658 R 662
2. Evaluate the impact of personal activities on the local environment.	SE: 663-667 <i>MiniLAB</i> 650 <i>Lab</i> 654 TWE: SJ 649 D 653, 665 IL 659 A 662

Codes Used for TWE Pages

A	Assessment
ACT	Activity
AIL	Alternative Inquiry Lab
CB	Content Background
CC	Curriculum Connection
CD	Cultural Diversity
CFU	Check for Understanding
CYD	Communicating Your Data
D	Discussion
DI	Differentiated Instruction
IL	Inquiry Lab
IM	Identifying Misconceptions
LD	Lab Demonstration
MM	Make a Model
QD	Quick Demo
R	Reteach
SCB	Science Content Background
SJ	Science Journal
T	Technology
TFYI	Teacher FYI
TPK	Tie to Prior Knowledge
UAA	Use an Analogy
V	Visualizing the Water Cycle
VL	Visual Learning