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Benchmarks for Science Literacy
Levels 3-5

	Level 3 *Subsystems and Variables*	Level 3 *Populations*	Level 4 *Relative Position and Motion*	Level 4 *Environments*	Level 5 *Energy Sources*	Level 5 *Communities*
Chapter 1: The Nature of Science						
The Scientific World View						
Results of similar scientific investigations seldom turn out exactly the same. Sometimes this is because of unexpected differences in the things being investigated, sometimes because of unrealized differences in the methods used or in the circumstances in which the investigation is carried out, and sometimes just because of uncertainties in observations. It is not always easy to tell which.	◆L	◆	◆L	◆	◆L	◆
Scientific Inquiry						
Scientific investigations may take many different forms, including observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments. Investigations can focus on physical, biological, and social questions.	◆LT	◆LT	◆LT	◆LT	◆LT	◆LT
Results of scientific investigations are seldom exactly the same, but if the differences are large, it is important to try to figure out why. One reason for following directions carefully and for keeping records of one's work is to provide information on what might have caused the differences.	◆	◆	◆	◆	◆	◆
Scientists' explanations about what happens in the world come partly from what they observe, partly from what they think. Sometimes scientists have different explanations for the same set of observations. That usually leads to their making more observations to resolve the differences.	◆	◆	◆	◆	◆	◆
Scientists do not pay much attention to claims about how something they know about works unless the claims are backed up with evidence that can be confirmed and with a logical argument.	◆	◆	◆	◆	◆	◆
The Scientific Enterprise						
Science is an adventure that people everywhere can take part in, as they have for many centuries.	◆	◆	◆	◆	◆	◆
Clear communication is an essential part of doing science. It enables scientists to inform others about their work, expose their ideas to criticism by other scientists, and stay informed about scientific discoveries around the world.	◆	◆	◆	◆	◆	◆
Doing science involves many different kinds of work and engages men and women of all ages and backgrounds.	◆	◆	◆L	◆	◆	◆
Chapter 2: The Nature of Mathematics						
Patterns and Relationships						
Mathematics is the study of many kinds of patterns, including numbers and shapes and operations on them. Sometimes patterns are studied because they help to explain how the world works or how to solve practical problems, sometimes because they are interesting in themselves.	◆	◆	◆	◆	◆	◆

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Mathematical ideas can be represented concretely, graphically, and symbolically.	◆T	◆	◆	◆	◆	◆
Mathematics, Science and Technology						
No Benchmarks for this level.						
Mathematical Inquiry						
Numbers and shapes--and operations on them--help to describe and predict things about the world around us.	◆	◆	◆		◆	
In using mathematics, choices have to be made about what operations will give the best results. Results should always be judged by whether they make sense and are useful.	◆	◆	◆	◆	◆	◆
Chapter 3: The Nature of Technology						
Technology and Science						
Throughout all of history, people everywhere have invented and used tools. Most tools of today are different from those of the past, but many are modifications of very ancient tools.	◆		◆	◆	◆	◆
Technology enables scientists and others to observe things that are too small or too far away to be seen without them and to study the motion of objects that are moving very rapidly or are hardly moving at all.	◆	◆	◆LT	◆		◆
Measuring instruments can be used to gather accurate information for making scientific comparisons of objects and events and for designing and constructing things that will work properly.	◆		◆T	◆L	◆T	◆T
Technology extends the ability of people to change the world: to cut, shape, or put together materials; to move things from one place to another; and to reach farther with their hands, voices, senses, and minds. The changes may be for survival needs such as food, shelter, and defense, for communication and transportation, or to gain knowledge and express ideas.	◆	◆	◆L	◆	◆L	◆
Design and Systems						
There is no perfect design. Designs that are best in one respect (safety or ease of use, for example) may be inferior in other ways (cost or appearance). Usually some features must be sacrificed to get others. How such trade-offs are received depends upon which features are emphasized and which are down-played.	◆	◆	◆	◆	◆	
Even a good design may fail. Sometimes steps can be taken ahead of time to reduce the likelihood of failure, but it cannot be entirely eliminated.	◆		◆	◆	◆	
The solution to one problem may create other problems.	◆	◆	◆	◆	◆	

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Issues in Technology						
Technology has been part of life on the earth since the advent of the human species. Like language, ritual, commerce, and the arts, technology is an intrinsic part of human culture, and it both shapes society and is shaped by it. The technology available to people greatly influences what their lives are like.	◆	◆	◆	◆	◆	◆
Any invention is likely to lead to other inventions. Once an invention exists, people are likely to think up ways of using it that were never imagined at first.	◆		◆L		◆	
Transportation, communications, nutrition, sanitation, health care, entertainment, and other technologies give large numbers of people today the goods and services that once were luxuries enjoyed only by the wealthy. These benefits are not equally available to everyone.	◆	◆	◆	◆	◆	◆
Scientific laws, engineering principles, properties of materials, and construction techniques must be taken into account in designing engineering solutions to problems. Other factors, such as cost, safety, appearance, environmental impact, and what will happen if the solution fails also must be considered.	◆		◆		◆	
Technologies often have drawbacks as well as benefits. A technology that helps some people or organisms may hurt others--either deliberately (as weapons can) or inadvertently (as pesticides can). When harm occurs or seems likely, choices have to be made or new solutions found.	◆	◆		◆	◆	◆
Because of their ability to invent tools and processes, people have an enormous effect on the lives of other living things.	◆	◆	L	◆	◆	◆
Chapter 4: The Physical Setting						
The Universe						
The patterns of stars in the sky stay the same, although they appear to move across the sky nightly, and different stars can be seen in different seasons.			◆			
Telescopes magnify the appearance of some distant objects in the sky, including the moon and the planets. The number of stars that can be seen through telescopes is dramatically greater than can be seen by the unaided eye.			◆			
Planets change their positions against the background of stars.			◆			
The earth is one of several planets that orbit the sun, and the moon orbits around the earth.	◆		◆L			
Stars are like the sun, some being smaller and some larger, but so far away that they look like points of light.			◆			

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The Earth						
Things on or near the earth are pulled toward it by the earth's gravity.						
Like all planets and stars, the earth is approximately spherical in shape. The rotation of the earth on its axis every 24 hours produces the night-and-day cycle. To people on earth, this turning of the planet makes it seem as though the sun, moon, planets, and stars are orbiting the earth once a day.			◆			
When liquid water disappears, it turns into a gas (vapor) in the air and can reappear as a liquid when cooled, or as a solid if cooled below the freezing point of water. Clouds and fog are made of tiny droplets of water.	◆				◆	
Air is substance that surrounds us, takes up space, and whose movement we feel as wind.	◆		◆			
Processes That Shape the Earth						
Waves, wind, water, and ice shape and reshape the earth's land surface by eroding rock and soil in some areas and depositing them in other areas, sometimes in seasonal layers.			◆			
Rock is composed of different combinations of minerals. Smaller rocks come from the breakage and weathering of bedrock and larger rocks. Soil is made partly from weathered rock, partly from plant remains--and also contains many living organisms.	◆L					
The Structure of Matter						
Heating and cooling cause changes in the properties of materials. Many kinds of changes occur faster under hotter conditions.	◆	◆		◆	◆	◆
No matter how parts of an object are assembled, the weight of the whole object is always the same as the sum of the parts; and when a thing is broken into parts, the parts have the same total weight as the original thing.	◆			◆		
Materials may be composed of parts that are too small to be seen without magnification.	◆					
When a new material is made by combining two or more materials, it has properties that are different from the original materials. For that reason, a lot of different materials can be made from a small number of basic kinds of materials.	◆				◆	
Energy Transformations						
Things that give off light often also give off heat. Heat is produced by mechanical and electrical machines, and any time one thing rubs against something else.	◆		◆	◆	◆L	
When warmer things are put with cooler ones, the warm ones lose heat and the cool ones gain it until they are all the same temperature. A warmer object can warm a cooler one by contact or at a distance.	◆	◆			◆L	

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Some materials conduct heat much better than others. Poor conductors can reduce heat loss.	◆				◆L	
Motion						
Changes in speed or direction of motion are caused by forces. The greater the force is, the greater the change in motion will be. The more massive an object is, the less effect a given force will have.	◆	◆	◆		◆L	
How fast things move differs greatly. Some things are so slow that their journey takes a long time; others move too fast for people to even see them.	◆	◆	◆		◆	
Forces of Nature						
The earth's gravity pulls any object toward it without touching it.	T					
Without touching them, a magnet pulls on things made of iron and either pushes or pulls on other magnets.	◆T		◆			
Without touching them, material that has been electrically charged pulls on all other materials and may either push or pull orther charged materials.	◆T					
Chapter 5: The Living Environment						
The Diversity of Life						
A great variety of kinds of living things can be sorted into groups in many ways using various features to decide which things belong to which group.		◆		◆		◆
Features used for grouping depend on the purpose of the grouping.		◆		◆		◆
Heredity						
Some likenesses between children and parents, such as eye color in human beings, or fruit or flower color in plants, are inherited. Other likenesses, such as people's table manners or carpentry skills, are learned.		◆		◆		◆
For offspring to resemble their parents, there must be a reliable way to transfer information from one generation to the next.						
Cells						
Some living things consist of a single cell. Like familiar organisms, the need food, water, and air; a way to dispose of waste; and an environment they can live in.		◆				◆
Microscopes make it possible to see that living things are made mostly of cells. Some organisms are made of a collection of similar cells that benefit from cooperating. Some organisms' cells vary greatly in appearance and perform very different roles in the organism.						

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Interdependence of Life						
For any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.		◆		◆T		◆
Insects and various other organisms depend on dead plant and animal material for food.		◆		◆		◆L
Organisms interact with one another in various ways besides providing food. Many plants depend on animals for carrying their pollen to other plants or for dispersing their seeds.		◆		◆		◆
Changes in an organism's habitat are sometimes beneficial to it and sometimes harmful.		◆		◆		◆
Most microorganisms do not cause disease, and many are beneficial.						◆
Flow of Matter and Energy						
Almost all kinds of animals' food can be traced back to plants.		◆		◆		◆
Some source of "energy" is needed for all organisms to stay alive and grow.		◆		◆		◆
Over the whole earth, organisms are growing, dying, and decaying, and new organisms are being produced by the old ones.		◆		◆		◆
Evolution of Life						
Individuals of the same kind differ in their characteristics, and sometimes the differences give individuals an advantage in surviving and reproducing.		◆		◆		◆
Fossils can be compared to one another and to living organisms according to their similarities and differences. Some organisms that lived long ago are similar to existing organisms, but some are quite different.						
Chapter 6: The Human Organism						
Human Identity						
Unlike in human beings, behavior in insects and many other species is determined almost entirely by biological inheritance.						
Human beings have made tools and machines to sense and do things that they could not do otherwise sense or do at all, or as quickly, or as well.	◆		◆			
Artifacts and preserved remains provide some evidence of the physical characteristics and possible behavior of human beings who lived a very long time ago.						
Human Development						
It takes about 9 months for a human embryo to develop. Embryos are nourished by the mother, so substances she takes in will affect how well or poorly the baby develops.		◆				

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Human beings live longer than most others animals, but all living things die.						
There is a usual sequence of physical and mental development among human beings, although individuals differ in exactly when they learn things.						
People are usually able to have children before they are able to care for them properly.						
Basic Function						
From food, people obtain energy and materials for body repair and growth. The indigestible parts of food are eliminated.						◆
By breathing, people take in the oxygen they need to live.						
Skin protects the body from harmful substances and other organisms and from drying out.						
The brain gets signals from all parts of the body telling what is going on there. The brain also sends signals to parts of the body to influence what they do.						
Learning						
Human beings have different interests, motivations, skills, and talents.					◆	◆
Human beings can use the memory of their past experiences to make judgements about new situations.	◆	◆	◆	◆	◆	◆
Many skills can be practiced until they become automatic. If the right skills are practiced, performance may improve.	◆	◆	◆	◆	◆	◆
Human beings tend to repeat behaviors that feel good or have pleasant consequences and avoid behaviors that feel bad or have unpleasant consequences.						
Learning means using what one already knows to make sense out of new experiences or information, not just storing the new information in one's head.	◆	◆	◆	◆	◆	◆
Physical Health						
Food provides energy and materials for growth and repair of body parts. Vitamins and minerals, present in small amounts in foods, are essential to keep everything working well. As people grow up, the amounts and kinds of food exercise needed by the body may change.	◆					◆
Tobacco, alcohol, other drugs, and certain poisons in the environment (pesticides, lead) can harm human beings and other living things.						
If germs are able to get inside one's body, they may keep it from working properly. For defense against germs, the human body has tears, saliva, skin, some blood cells, and stomach secretions. A healthy body can fight most germs that do get inside. However, there are some germs that interfere with the body's defenses.				◆		

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There are some diseases that human beings can catch only once. After they've recovered they don't get sick from them again. There are many diseases that can be prevented by vaccination, so that people don't catch them even once.						
Mental Health						
Different individuals handle their feelings differently, and sometimes they have different feelings in the same situation.		◆				
Often human beings don't understand why others act they way they do, and sometimes they don't understand their own behavior and feelings.						
Physical health can affect people's emotional well-being and vice versa.						
One way to respond to a strong feeling, either pleasant or unpleasant, is to think about what caused it and then consider whether to seek out or avoid similar situations.						
Chapter 7: Human Society						
Cultural Effects on Behavior						
People can learn about others from direct experience, from the mass communications media, and from listening to other people talk about their work and their lives. People also sometimes imitate people--or characters--in the media.	◆	◆	◆		◆	
People tend to feel uncomfortable with other people who dress, talk, or act very differently from themselves. What is considered to be acceptable human behavior varies from culture to culture and from one time period to another, but there are some behaviors that are unacceptable in almost all cultures, past and present.						
Group Behavior						
People often like or dislike other people because of membership in or exclusion from a particular social group. Individuals tend to support members of their own group and perceive them as being like themselves.						
Different groups have different expectations for how their members should act. Sometimes the rules are written down and strictly enforced, sometiems they are just understood from example.						◆
When acting together, members of a group and even people in a crowd sometimes do and say things, good or bad, that they would not do or say on their own.						

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Social Change						
Although rules at home, school, church, and in the community stay mostly the same, sometimes they change. Changes in social arrangements happen because some rules do not work or new people are involved or outside circumstances change.						
Rules and laws can sometimes be changed by getting most of the people they affect to agree to change them.						
Social Trade-Offs						
In making decisions, it helps to take time to consider the benefits and drawbacks of alternatives.				◆	◆	
In making decisions, benefits and drawbacks of alternatives can be taken into account more effectively if the people who will be affected are involved.				◆		
Sometimes social decisions have unexpected consequences, not matter how carefully the decisions are made.				◆		
Political and Economic Systems						
People tend to live together in goups and therefore have to have ways of deciding who will do what.						◆
Services that everyone gets, such as schools, libraries, parks, mail service, and police and fire protection, are usually provided by government.				◆		
There are not enough resources to satisfy all the desires of all people, and so there has to be some way of deciding who gets what.				◆		◆
Some jobs require more (or more expensive) training than others, some involve more risk, and some pay better.						
Social Conflict						
Communicating the different points of view in a dispute can often help people to find a satisfactory compromise.				◆		
Resolving a conflict by force rather than compromise can lead to more problems.						
One person's exercise of freedom may conflict with the freedom of others. Rules can help to resolve conflicting freedoms.						
If a conflict cannot be settled by compromise, it may be decided by a vote--if everyone agrees to accept the results.						

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Global Interdependence						
Many of the things people eat and wear come from other countries, and people in those countries use things from this country. Trade occurs between nations, between different people, and between regions in the same nation. Decisions made in one country about what is produced there may have an effect on other countries.	◆	◆	◆			◆
Chapter 8: The Designed World						
Agriculture						
Some plant varieties and animal breeds have more desirable characteristics than others, but some may be more difficult or costly to grow. The kinds of crops that can grow in an area depend on the climate and soil. Irrigation and fertilizers can help crops grow in places where there is too little water or the soil is poor.		◆		◆		◆
The damage to crops caused by rodents, weeds, and insects can be reduced by using poisons, but their use may harm other plants or animals as well, and pests tend to develop resistance to poisons.						
Heating, salting, smoking, drying, cooling, and airtight packaging are ways to slow down the spoiling of food by microscopic organisms. These methods make it possible for food to be stored for long intervals before being used.						
Modern technology has increased the efficiency of agriculture so that fewer people are needed to work on farms than ever before.				◆		
Places too cold or dry to grow certain crops can obtain food from places with more suitable climates. Much of the food eaten by Americans comes from other parts of the country and other places in the world.				◆		
Materials and Manufacturing						
Naturally occurring materials such as wood, clay, cotton, and animal skins may be processed or combined with other materials to change their properties.						
Through science and technology, a wide variety of materials that do not appear in nature at all have become available, ranging from steel to nylon to liquid crystals.	◆					
Discarded products contribute to the problem of waste disposal. Sometimes it is possible to use the materials in them to make new products, but materials differ widely in the ease with which they can be recycled.	◆					

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Through mass production, the time required to make a product and its cost can be greatly reduced. Although many things are still made by hand in some parts of the world, almost everything in the most technologically developed countries is now produced using automatic machines. Even automatic machines require human supervision.						
Energy Sources and Use						
Moving air and water can be used to run machines.					◆	
The sun is the main source of energy for people and they use it in various ways. The energy in fossil fuels such as oil and coal comes from the sun indirectly, because the fuels come from plants that grew long ago.					◆L	
Some energy sources cost less than others and some cause less pollution than others.					◆	
People try to conserve energy in order to slow down the depletion of energy resources and/or to save money.					◆	
Communication						
People have always tried to communicate with one another. Signed and spoken language was one of the first inventions. Early forms of recording messages used markings on materials such as wood or stone.						
Communication involves coding and decoding information. In any language, both the sender and the receiver have to know the same code, which means that secret codes can be used to keep communication private.	◆	◆	◆	◆	◆	◆
People have invented devices, such as paper and ink, engraved plastic disks, and magnetic tapes for recording information. These devices enable great amounts of information to be stored and retrieved--and be sent to one or many other people or places.				◆		
Communication technologies make it possible to send and receive information more and more reliably, quickly, and cheaply over long distances.						
Information Processing						
Computers are controlled partly by how they are wired and partly by special instructions called programs that are entered into a computer's memory. Some programs stay permanently in the machine but most are coded on disks and transferred into and out of the computer to suit the user.						
Computers can be programmed to store, retrieve, and perform operations on information. These operations include mathematical calculations, word processing, diagram drawing, and the modeling of complex events.						

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Mistakes can occur when people enter programs or data into a computer. Computers themselves can make errors in information processing because of defects in their hardware or software.						
Health Technology						
There are normal ranges for body measurements--including temperature, heart rate, and what is in the blood and urine--that help to tell when people are well. Tools, such as thermometers and x-ray machines, provide us clues about what is happening inside the body.	◆					
Technology has made it possible to repair and sometimes replace some body parts.						
Chapter 9: The Mathematical World						
Numbers						
The meaning of numerals in many-digit numbers depends on their positions.			◆			
In some situations, "0" means none of something, but in others it may just be the label of some point on a scale.	◆	◆	◆	◆	◆	◆
When people care about what is being counted or measured, it is important for them to say what the units are (three degrees Fahrenheit is different from three centimeters, three miles from three miles per hour).	◆	◆	◆	◆	◆	◆
Measurements are always likely to give slightly different numbers, even if what is being measured stays the same.	◆	◆	◆	◆	◆	◆
Symbolic Relationships						
Mathematical statements using symbols may be true only when the symbols are replaced by certain numbers.					◆	
Tables and graphs can show how values of one quantity are related to values of another.	◆T	◆	◆	◆	◆	◆
Shapes						
Length can be thought of as unit lengths joined together, area as a collection of unit squares, and volume as a set of unit cubes.			◆			
If 0 and 1 are located on a line, any other number can be depicted as a positions on the line.	◆	◆	◆	◆	◆	◆
Graphical display of numbers may make it possible to spot patterns that are not otherwise obvious, such as a comparative size and trends.	◆	◆	◆	◆	◆	◆
Many objects can be described in terms of simple plane figures and solids. Shapes can be compared in terms of concepts such as parallel and perpendicular, congruence and similarity, and symmetry. Symmetry can be found by reflection, turns, or slides.	◆		◆		◆	

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Areas of irregular shapes can be found by dividing them into squares and triangles.			◆			
Scale drawings show shapes and compare locations of things very different in size.	◆	◆	◆	◆	◆	◆
Uncertainty						
Some predictions can be based on what is known about the past, assuming that conditions are pretty much the same now.	◆	◆	◆	◆	◆	◆
Statistical predictions (as for rainy days, accidents) are typically better for how many of a group will experience something than for which members of the group will experience it--and better for how often something will happen than for exactly when.	◆	◆	◆	◆	◆	◆
Summary predictions are usually more accurate for large collections of events than for just a few. Even very unlikely events may occur fairly often in very large populations.	◆	◆		◆	◆	◆
Spreading data out on a number line helps to see what the extremes are, where they pile up, and where the gaps are. A summary of data includes where the middle is and how much spread is around it.	◆	◆	◆	◆	◆	◆
A small part of something may be special in some way and not give an accurate picture of the whole. How much a portion of something can help to estimate what the whole is like depends on how the portion is chosen. There is danger of choosing only the data that show what is expected by the person doing the choosing.	◆	◆		◆	◆	◆
Reasoning						
One way to make sense of something is to think how it is like something more familiar.	◆	◆	◆	◆	◆	◆
Reasoning can be distorted by strong feelings.			◆	◆	◆	◆
Chapter 10: Historical Perspectives						
There are no benchmarks for this level.						
Chapter 11: Common Themes						
Systems						
In something that consists of many parts, the parts usually influence one another.	◆		◆	◆	◆	◆
Something may not work as well (or at all) if a part of it is missing, broken, worn out, mismatched, or misconnected.	◆		◆	◆	◆	◆
Models						
Seeing how a model works after changes are made to it may suggest how the real thing would work if the same were done to it.	◆	◆	◆	◆	◆	◆

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Levels 3-5

	Level 3 *Subsystems and Variables*	Level 3 *Populations*	Level 4 *Relative Position and Motion*	Level 4 *Environments*	Level 5 *Energy Sources*	Level 5 *Communities*
Geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories can be used to represent objects, events, and processes in the real world, although such representations can never be exact in every detail.	◆	◆	◆	◆	◆	◆
Constancy and Change						
Some features of things may stay the same even when other features change. Some patterns look the same when they are shifted over, or turned, or reflected, or seen from different directions.	◆		◆		◆	
Things change in steady, repetitive, or irregular ways--or sometimes in more than one way at the same time. Often the best way to tell which kinds of change are happening is to make a table or graph of measurements.	◆	◆	◆	◆	◆	◆
Scale						
Almost anything has limits on how big or small it can be.		◆	◆	◆	◆	◆
Finding out what the biggest and smallest possible values of something are is often as revealing as knowing what the usual value is.		◆	◆	◆	◆	◆
Chapter 12: Habits of Mind						
Values and Attitudes						
Keep records of their investigations and observations and not change the records later.	◆	◆	◆	◆	◆	◆
Offer reasons for their findings and consider reasons suggested by others.	◆	◆	◆	◆	◆	◆
Computation and Estimation						
Add, subtract, mulitply, and divide whole numbers mentally, on paper, and with a calculator.	◆	◆	◆	◆	◆	◆
Use fractions and decimals, translating when necessary between decimals and commonly encountered fractions--halves, thirds, fourths, fifths, tenths, and hundredths (but not sixths, sevenths, etc.).					◆	◆
Judge whether measurement and computations of quantities such as length, area, volume, weight, or time are reasonable in a familiar context by comparing them to typical values.	◆	◆	◆	◆	◆	◆
State the purpose of each step in a calculation.	◆					
Read and follow step-by-step instruction in a calculator or computer manual when learning new procedures.						
Manipulation and Observation						
Choose appropriate common materials for making simple mechanical construction and repairing things.	◆				◆	
Measure and mix dry and liquid materials (in the kitchen, garage, or laboratory) in prescribed amounts, exercising reasonable safety.	◆	◆		◆		◆

T See Techonology Correlation
L See Literature Correlation

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Benchmarks for Science Literacy
Levels 3-5

	Level 3 *Subsystems and Variables*	Level 3 *Populations*	Level 4 *Relative Position and Motion*	Level 4 *Environments*	Level 5 *Energy Sources*	Level 5 *Communities*
Keep a notebook that describes observations made, carefully distinguishes actual observation from ideas and speculations about what was observed, and is understandable weeks or months later.	◆	◆	◆	◆	◆	◆
Use calculators to determine area and volume from linear dimensions, aggregate amounts of area, volume, weight, time, and cost, and find the difference between two quantities of anything.						
Make safe electrical connections with various plugs, sockets, and terminals.	◆				◆	
Communication Skills						
Write instructions that others can follow in carrying out a procedure.	◆	◆	◆	◆	◆	◆
Make sketches to aid in explaining procedures or ideas.	◆	◆	◆	◆	◆	◆
Use numerical data in describing and comparing objects and events.	◆	◆	◆	◆	◆	◆
Critical-Repsonse Skills						
Buttress their statements with facts found in books, articles, and databases, and identify the sources used and expect others to do the same.	◆	◆	◆	◆	◆	◆
Recognize when comparisons might not be fair because some conditions are not kept the same.	◆	◆	◆	◆	◆	◆
Seek better reasons for believing something than "Everybody knows that…" or "I just know" and discount such reasons when given by others.	◆	◆	◆	◆	◆	◆

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