

Kindergarten Science Curriculum

The Seymour School District believes that every student needs and deserves a rich and challenging education in science. Quality education in science is an integral part of the core curriculum for our students. Students should be enabled to achieve the learning goals and standards outlined in Connecticut's science framework.

Such an education will promote essential understandings of the natural world and nurture student's abilities to apply scientific knowledge to make informed and logical judgments about personal and societal issues. Such an education requires that the fundamental approach to science is a creative process for investigating, reasoning, critiquing and communicating about ideas, not as a static body of facts to be memorized.

We believe that learning science is important for all students in order to prepare them to be informed individuals and citizens and to participate in a wide range of scientific and technological careers. Understanding the interconnections between science and technology, and their shared impact on environmental and societal issues, is essential in order to preserve and improve life on Earth.

Learning experiences in science should lead all students to:

- ❖ Understand and apply basic concepts, principles and theories of biology, chemistry, physics, earth and space sciences and their interrelationships;
- ❖ Recognize and participate in scientific endeavors which are evidence based and use inquiry skills that lead to a greater understanding of the world;
- ❖ Identify and solve problems through scientific exploration, including the formulation of hypotheses, design of experiments, use of technology, analysis of data and drawing of conclusions;
- ❖ Select and use properly appropriate laboratory technology, equipment and material, including measuring and sensing devices;
- ❖ Understand and use existing and emerging technologies which have an effect on society and the quality of life, including personal academic and work environments;
- ❖ Analyze the possibilities and limits of science and technology in order to make and defend decisions about societal issues; and
- ❖ Understand that the way in which scientific knowledge is formulated is crucial to the validity of that knowledge.

Teachers plan units and lessons that contain current, accurate and meaningful content that is aligned with the district curriculum. Through professional development, teachers keep up-to-date with the latest scientific advances in their discipline. They set a context for scientific

learning that is relevant to students in class. Engaging students in extended, where developmentally appropriate scientific investigations that motivate student effort and interest in scientific learning are planned. Students are provided with a safe environment in which to participate in scientific investigations and have the resources needed to support their learning; Students are assessed regularly to build an understanding instruction is adjusted to accommodate students with diverse needs, abilities and interests. Students are encouraged to pursue the study of advanced science and science-related careers.

Parents play an essential role in ensuring a quality educational program in science by encouraging their children to participate in high-level science courses and activities, both in and out of school and to talk to their children about science they learn at school and showing interest in scientific content, processes and ideas, and by providing their children with access to science resources, such as museums, libraries and the Internet.

CMT

The science portion of the test is administered to students in Grades 5 and 8. The CMT science assessments measure what students have learned over several years about core science concepts and about how scientific inquiry is done. The assessments include questions related to concepts in life science, physical science and earth science and how those concepts apply to real world issues and technologies.

EMBEDDED TASKS

To assess students' understanding of inquiry and the nature of science, the CMT science assessment includes some questions framed within the CONTEXT of the curriculum-embedded performance tasks developed by the Connecticut State Department of Education. The embedded tasks engage students in focused explorations of science concepts using all the inquiry practices described in the science framework. Each embedded task is designed to be part of a larger learning unit described in the science framework, and teachers decide when and how to incorporate them into the curriculum. These inquiry investigations demonstrate how students use science inquiry practices to deepen understanding of a science concept.

CSDE 2008

Kindergarten Science

K.1 Properties of Matter

Days

SUBTOPIC	DAYS	LESSON/ASSESSMENT	CT STANDARD	SOURCE
Sorting	5 Days	Voyages Unit 5 Winter Wonderland-Lesson - Mitten Magic/Center: The Surprise	K.1.2; K.1.3; K.1.4; K.1.5	Voyages Mathematics Program
Properties of Materials	1 Day	Read and Discuss <u>The Three Little Pigs</u> . Predict which objects are flexible/not flexible.	K.1.6	<u>The Three Little Pigs</u> & Objects from Voyages Mathematics Program
Sort Objects Based on Flexibility	1 Day	Resort objects from Day 1 of unit based on flexibility. Chart objects which are flexible/not flexible.	K.1.6	Objects from Voyages Mathematics Program
Measure Height	5 Day Center	Voyages Unit 5 Winter Wonderland/Center: Measurement Island	K.1.9	Voyages Mathematics Program
Measure Height	5 Days	Voyages Unit 9 Life in the Ocean Lesson – Count a Big Fish/Center: Measurement Island	K.1.9	Voyages Mathematics Program
Weight		Measure and Compare the Heaviness of Objects	K.1.7	RESOURCES NEEDED
Temperature		Measure and Compare Temperature	K.1.8	RESOURCES NEEDED

Grade 1 Science

K.2 Heredity and Evolution

Days

SUBTOPIC	DAYS	LESSON/ASSESSMENT	CT STANDARD	SOURCE
Organisms			K.2.1-K.2.9	RESOURCES NEEDED (STC Kit Organisms)
Living/Non-living	1 Day	Students will sort pictures/objects into categories based on living and non-living. Discuss and chart similarities among the objects in each group.	K.2.1	Living/Non-living Pictures and Objects
Characteristics of Living Things	1 Day	Students generate list of characteristics of common living things.	K.2.1; K.2.2; K.2.3; K.2.4; K.2.5	
Living Organisms	1 Day	Students choose a familiar living organism to draw and write about.	K.2.1 & K.2.5	
Parents and Offspring	1 Day	Students will recognize the similarities and differences between parents and offspring.	K.2.3	Variety of pictures of adult organisms and offspring
Lineage	1 Day	Read and discuss <u>Are You My Mother</u> . Discuss how organisms appear/ behave and alike/differently based on their lineage.	K.2.3	<u>Are You My Mother</u>
Lineage	1 Day	Read and discuss <u>Does a Kangeroo Have a Mother, Too?</u> Discuss how organisms appear/ behave and alike/differently based on their lineage.	K.2.3	<u>Does a Kangeroo Have a Mother, Too?</u>

Grade 1 Science

K.3 Energy in the Earth's Systems

September-June

SUBTOPIC	DAYS	LESSON/ASSESSMENT	CT STANDARD	SOURCE
Weather Observations	Ongoing	Voyages Units 3-9 Calendar/Weather Graph	K.3.1; K.3.2; K.3.3; K.3.4; K.3.5	Voyages Mathematics Program
Weather Observations	Ongoing	Voyages Units 3-9 Seasonal Weather Chart	K.3.1; K.3.2; K.3.3; K.3.4; K.3.5	Voyages Mathematics Program
Weather Influences	Ongoing	Students will discuss what they have worn to school and what they have brought with them and describe why it is appropriate.	K.3.4	
Weather Influences	Ongoing	Discuss clothing worn and feelings of characters as related to particular weather conditions.	K.3.4	
Weather Influences	Ongoing	Students discuss and record about particular weather conditions.	K.3.4	
Water		Precipitation	K.3.6	RESOURCES NEEDED
Clouds and Fog		Cloud Types	K.3.7	RESOURCES NEEDED
Wind		Observing Wind	K.3.8	RESOURCES NEEDED

Seymour Public Schools Curriculum

Kindergarten Science

K.4 Science and Technology in Society

Days

SUBTOPIC	DAYS	LESSON/ASSESSMENT	CT STANDARD	SOURCE
Houses/ Shelters	1 Day	KWL on what houses/shelters are for and what they are made of	K.4.1	
Building Materials	1 Day	Read <u>The Three Little Pigs</u> and discuss materials used to build the houses and how and why each material was able to stand up to the wolf.	K.4.1	<u>The Three Little Pigs</u>
Building Materials	2-3 Days	Chart student responses to different types of building materials. Read <u>Homes Around the World</u> and discuss the homes and what they are made of./Orally complete venn diagram comparing their home to a home they learned about in <u>Homes Around the World</u> .	K.4.1; K.4.2; K.4.3; K.4.4; K.4.5	<u>Homes Around the World</u>
Building Materials	1 Day	Students will sort various materials based on whether they can be used to build a house.	K.4.1	Various building materials
Impact of Weather on Building Materials	1 Day	Remind students about previous discussions about weather and appropriate clothing as well as homes around the world. Begin a discussion on why different materials are used to build houses in different areas around the world.	K.4.1; K.4.2; K.4.3	
Building Materials	2 Days	Test various materials for strength and weather appropriateness. Draw conclusions about what characteristics/properties materials have that make them good for certain types of building.	K.4.1; K.4.2; K.4.3; K.4.4	Various building materials
Man Made Materials	1 Day	Class will discuss the difference between natural and man made materials. Show students real life examples or pictures of various materials.	K.4.1; K.4.3	Various building materials and pictures of various building materials
Assessment	2 Days	Students will select materials to build a shelter that could stand up to various conditions. They will explain their		

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		choice of material.		
Animal Homes		Animal Shelters	K.4.5	RESOURCES NEEDED

Seymour Public Schools Curriculum

Grade: Kindergarten	Subject: Science
CSDE Standard	Properties of Matter
Enduring Understanding	Some properties can be observed with the senses, and others can be discovered by using simple tools or tests.
Essential Questions	How does the structure of matter affect the properties and uses of materials?
Content Standards:	K.1 Objects have properties that can be observed and used to describe similarities and differences.
Performance Expectations (Student outcomes)	<ol style="list-style-type: none"> 1. Humans have five senses that they use to observe their environment. A specific sense organ is associated with each sense. 2. Objects have properties that can be observed using the senses. Examples include size, weight, shape, color, texture, transparency, etc. An object’s observable properties do not include the object’s name or its uses. 3. Sorting objects into groups based on one (or more) of their properties makes it possible to observe and describe their similarities and differences. 4. Placing objects into groups based on their size or weight makes it possible to observe patterns and describe relationships among the objects in a group. 5. Objects can be described and sorted based on the materials from which they are made (for example: wood, paper, fabric, plastic, glass or metal). Objects can be made of a mixture of materials. 6. Objects can be described and sorted based on the results of simple tests. Simple tests include actions such as bending, squeezing, holding it near a magnet or putting it in water. Objects can be described as magnetic/nonmagnetic, flexible/not flexible, hard/soft, a floater/sinker, etc. 7. The heaviness of objects can be compared using the sense of touch. Balances and scales are measurement tools that allow people to observe and compare the heaviness of objects more accurately. Objects can be sorted into groups that have the

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students explain their rule. Have multiple students explain and also explore different ways to sort the items. (A INQ. 9)

Voyages Mathematics – Unit 5 Winter Wonderland-“Mitten Magic”; sorting objects

K.1.

- **(A2)** Read The Three Little Pigs and discuss materials used for building the houses. Use a straw, stick, and a block or brick to demonstrate the concept of flexibility. Teacher charts students predictions of which objects used in A.1 are flexible/not flexible (chart will be used at the end to record actual results). Students will use their objects from A.1 to re-sort objects by flexible/not flexible. Revisit predictions and fix chart to display results (A INQ. 3).
- Magnets and Float or Sink to be covered in Grade 2.

The Three Little Pigs

SmartBoard – Is it Bendy? (Reference the following website)...
http://www.bbc.co.uk/schools/scienceclips/ages/5_6/sorting_using_mate.shtml

Variety of objects (use objects from A 1.)

- Students will sort three objects by flexibility.
- Teacher observation.
- Teacher assessment of students’ predictions before the experiment.

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<p>K.1. (A3) <u>Voyages Mathematics Program</u> center activity-“Measurement Island” Use snap cubes to measure shortest to tallest.</p>	<p><u>Voyages Mathematics Program</u> <u>Voyages Mathematics Program</u> – Unit 5 <u>Winter Wonderland</u>-center activity-“Measurement Island”</p>	<p><u>Voyages Mathematics</u></p> <p>Give students objects of different weights and sizes. Ask students to use rulers and balances to sort the objects by size or weight.</p>
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Seymour Public Schools Curriculum

Grade: Kindergarten	<p style="text-align: center;">Subject: Science</p>
CSDE Standard	<p style="text-align: center;">Heredity and Evolution</p>
Enduring Understanding	<p style="text-align: center;">Living things have certain characteristics that distinguish them from nonliving things, including growth, movement, reproduction and response to stimuli.</p>
Essential Questions	<p style="text-align: center;">What processes are responsible for life's unity and diversity?</p>
Content Standards:	<p style="text-align: center;">K.2 - Many different kinds of living things inhabit the Earth.</p>
Performance Expectations (Student outcomes)	<ol style="list-style-type: none"> 1. Things in our environment can be classified based on whether they are alive, were once alive or whether they were never alive. 2. Growth is an observable characteristic common to living things. 3. Reproduction is an observable characteristic common to living things. Living things can be classified into groups based on the different ways they reproduce. For example, some living things lay eggs, while others produce seeds or give birth. Offspring generally resemble their parents but are not identical to them. 4. Many living things move in response to their environment, but movement alone is not evidence of life. For example, cars and the wind both move, but they are not alive. 5. Plants and animals are living things. Plants have characteristics (such as roots, stems, leaves and flowers) that animals do not have. Animals have characteristics (such as body parts and body coverings) that plants do not have. 6. Animals can be classified into groups based on generally similar characteristics such as number of legs,

Seymour Public Schools Curriculum

	<p>type of body covering, or way of moving. Some animal groups are reptiles, insects, birds, fish and mammals.</p> <p>7. Members of the same group of animals can look and behave very differently from each other. For example, goldfish and sharks are both fish, but there are distinct differences in their size, color and lifestyle. In addition, all goldfish are not identical to each other and neither are all sharks.</p> <p>8. Plants can be classified into groups based on similarities in the appearance of their leaves, stems, blossoms or fruits. Some plant groups are grasses, vegetables, flowering plants and trees.</p> <p>9. Members of the same group of plants can look and behave very differently from each other. For example, although oaks and palms are both trees, their size, shape, leaves and bark are very different. In addition, all oak trees are not identical to each other and neither are all palms.</p>	
Strategies/Modes (examples)	Materials/Resources (examples)	Assessments (examples)
<p>K.2.</p> <ul style="list-style-type: none"> (A6) Using pictures/objects have students sort into categories based on living/nonliving. Find and discuss the similarities found among the objects in each group. Then create a chart of characteristics related to living and 	<p>KEY SCIENCE VOCABULARY: classify, reproduction, offspring, characteristics, reptile, insect, mammal</p> <p style="background-color: yellow;">Consider adding STC Organisms</p> <ul style="list-style-type: none"> Variety of pictures/objects of living things Variety of pictures/objects of non-living things 	<p>A 4. Describe the similarities and differences in the appearance and behaviors of plants, birds, fish, insects and mammals (including humans).</p> <p>A 5. Describe the similarities and differences in the appearance and behaviors of adults and their offspring.</p> <p>A 6. Describe characteristics that distinguish living from nonliving things.</p> <ul style="list-style-type: none"> Students will select a living and a nonliving thing and draw/write or discuss how they know the object is living or nonliving. Teacher observation of student sort.

Seymour Public Schools Curriculum

<p>nonliving things. (A INQ 1,6).</p> <p>K.2.</p> <ul style="list-style-type: none"> • (A4) Create student generated list of common characteristics (appearance, behavior) of living things listed in A4. Bring in pictures/examples to help students generate ideas - (A INQ.1 and A INQ. 4) • Students will select a living organism to draw or write about. Students will include appearance, behaviors, habitat of their organism (A INQ.6). <p>K.2</p> <ul style="list-style-type: none"> • (A5) Bring in pictures (baby pictures, parent pictures, animals and offspring); identify similarities and differences between the pictures (hair color, eye color, size, etc.) A INQ 4,5). • Discuss how organisms appear/ behave alike/differently based on their lineage (A INQ. 4,5). • Students will complete a graphic organizer showing similarities/differences between an adult and its offspring. 	<ul style="list-style-type: none"> • Variety of picture cards/items of living organisms (plants, birds, fish, insects, mammals). <ul style="list-style-type: none"> • Variety of graphic organizers • Variety of picture cards of adult organisms and offspring • <u>Read Are You My Mother?</u> By, P.D. Eastman • <u>Read Does a Kangaroo Have a Mother, Too?</u> By, Eric Carle 	<ul style="list-style-type: none"> • Give students picture cards to match adults with offspring.
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Seymour Public Schools Curriculum

Grade: Kindergarten	Subject: Science
CSDE Standard	Energy in the Earth's Systems
Enduring Understanding	Daily and seasonal weather conditions affect what we do, what we wear and how we feel.
Essential Questions	How do external and internal sources of energy affect the Earth's systems?
Content Standards:	K.3 – Weather conditions vary daily and seasonally.
Performance Expectations (Student outcomes)	<ol style="list-style-type: none"> 1. The sun is the source of heat and light that warms the land, air and water. Variations in the amount of sunlight that reaches the earth cause the weather. 2. Weather conditions can be observed and described as sunny, cloudy, rainy, foggy, snowy, stormy, windy, hot or cold. Weather observations can be made based on how we feel, what we see or hear, or by using weather measurement instruments such as thermometers. 3. Changes in weather conditions can be recorded during different times of day, from day to day, and over longer periods of time (seasonal cycle). Repeated observations can show patterns that can be used to predict general weather conditions. For example, temperatures are generally cooler at night than during the day and colder in winter than in spring, summer or fall. 4. Weather influences how we dress, how we feel, and what we do outside. 5. Weather affects the land, animals and plants, and bodies of water. 6. When the temperature is below “freezing,” water outside freezes to ice and precipitation falls as snow or ice; when the temperature is above freezing, ice and snow melt and precipitation falls as rain.

Seymour Public Schools Curriculum

	<p>7. Clouds and fog are made of tiny drops of water. Clouds have different shapes, sizes and colors that can be observed and compared. Some cloud types are associated with precipitation and some with fair weather.</p> <p>8. Wind is moving air. Sometimes air moves fast and sometimes it hardly moves at all. Wind speed can be estimated by observing the things that it moves, such as flags, tree branches or sailboats.</p>	
<p>Strategies/Modes (examples)</p> <p>K.3 (A7)</p> <ul style="list-style-type: none"> As a daily activity students track the weather by stating the weather conditions outside using their senses. Students will select appropriate picture cards to track the weather on a daily weather chart. (A INQ.2). Students track daily weather on a bar graph to show patterns as seasons change (A INQ.10). Students will predict the next day’s weather (A INQ.3). Create a chart of weather characteristics related to specific seasons including measuring temperature and how it changes for each season. (A INQ.7). Generate a list of descriptive weather words that can be used to describe daily weather. <p>K.3 (A8)</p> <ul style="list-style-type: none"> Students will record in their daily journal what they have worn to school and brought with them (boots, umbrella, hat) and describe why it is appropriate. (A INQ.6). 	<p>Materials/Resources (examples)</p> <p>Resources are needed</p> <ul style="list-style-type: none"> Consider STC Weather Lesson 2 – Weather Observation Using Senses. (A INQ.2). What to wear: http://www.kizclub.com/clothesbook/clothes.html What’s the weather? http://www.fossweb.com/modulesK-2/AirandWeather/index.html Weather Chart and picture cards 	<p>Assessments (examples)</p> <p>A 7. Describe and record daily weather conditions.</p> <p>A 8. Relate seasonal weather patterns to appropriate choices of clothing and activities.</p> <ul style="list-style-type: none"> Teacher observation of individual student reporting of daily weather and explaining their report. Give students opportunities to describe or write weather related phrases or sentences describing the conditions using words from the list previously created. Give students pictures that have different weather conditions and have students describe what is observed in each picture. Students select a weather type and tell how they feel when that weather is present and why they feel that way. Students can look through their daily journals and find similarities in their clothing and feelings on days when there is similar weather.

Seymour Public Schools Curriculum

<ul style="list-style-type: none">• Read seasonal books and discuss the clothing worn and the feelings of the characters. Draw conclusions about clothing and feelings as related to particular weather conditions. (A INQ.5).• Students can record their feelings about particular weather conditions. (A INQ.6).• Discuss the seasons and related weather. Create charts of weather for each season. (A INQ.1).		<ul style="list-style-type: none">• Students pick a weather card and draw a picture of what they should wear to be dressed appropriately to play outside.• Students can also draw an activity that can be done during that weather condition.
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Seymour Public Schools Curriculum

Grade: Kindergarten	Subject: Science
CSDE Standard	Science and Technology in Society
Enduring Understanding	Humans select both natural and man-made materials to build shelters based on local climate conditions, properties of the materials, and their availability in the environment.
Essential Questions	How do science and technology affect the quality of our lives?
Content Standards:	K.4 – Some objects are natural, while others have been designed and made by people to improve the quality of life.
Performance Expectations (Student outcomes)	<ol style="list-style-type: none"> 1. People need shelters to keep warm or cool, dry and safe. Shelters are made of materials that have properties that make them useful for different purposes. 2. People in different regions of the world build different kinds of shelters, depending on the materials available to them, the local climate and their customs. 3. Traditionally, people have built shelters using materials that they find nearby. Today, people build houses from materials that may come from far away. <ol style="list-style-type: none"> a. People who live in forested regions have traditionally built shelters using wood and/or leaves from nearby trees. b. People who live in regions with clay soils have traditionally built shelters using bricks or adobe made from clay. c. People who live in snowy regions have traditionally built shelters using snow and ice. d. People who live in regions with large animals have traditionally built shelters using animal skins. 4. Although they may look quite different, most shelters have walls, roofs and an entrance/exit; some shelters have doors, windows and floors. Walls, roofs and windows are made of materials that have specific properties. For example, walls require materials that are rigid, windows require materials that are transparent, and roofs require materials that are water-resistant.

Seymour Public Schools Curriculum

5. Animals build shelters using materials that are easily available to them. The materials they use have properties that help the animals stay warm or cool, dry and safe.

Strategies/Modes (examples)	Materials/Resources (examples)	Assessments (examples)
<p>K.4 (A9)</p> <ul style="list-style-type: none"> • K-W-L on what shelters/houses are for, what they are made of, etc. (A INQ.1). • Read <u>The Three Little Pigs</u> and discuss the different materials used to build their houses. Discuss how each of the houses was able to stand up to the wolf and why. (A INQ 5). • Ask students to tell what different materials are used to create different homes and buildings. Create a chart of student responses. Read iOPENERS <u>Homes Around the World</u> and add to chart when a new idea is presented. Discuss if students have ever seen a home like this, why they think it is built with that material, and what it would be like to live in that house. (A INQ.1 and 5). • Discuss climate conditions and the benefits of these homes. (A INQ.4). • Give students various materials - some of which can be used to really build houses and some that are not materials usually used for houses. Ask students to sort materials into materials used to build and materials 	<p>KEY SCIENCE VOCABULARY: shelter, rigid, transparent</p> <ul style="list-style-type: none"> • iOPENERS <u>Homes Around the World</u> • Online Story – <u>The Three Little Pigs</u> http://www.bbc.co.uk/cbeebies/tweenies/storytime/stories/3littlepigs/ • Various materials for house building activity • Natural and manmade materials or picture cards <p>Additional resources may be needed.</p>	<p>A9. Describe the types of materials used by people to build houses, and the properties that make the materials useful.</p> <ul style="list-style-type: none"> • Teacher observation of students during experiments and discussions. • Have students’ create a house collage appropriate for a certain season or climate by using pictures from various magazines or students own drawings. • Students choose a new home that they learned about in <u>Homes Around the World</u> and orally complete a Venn diagram or draw pictures to show how this new home would be different from their homes that they live in. • Give students various materials that they can use (such as blocks, sugar cubes, pretzels, LEGOS) to create a shelter that can stand up to different conditions tested in experiment. Students explain choice of material.

Seymour Public Schools Curriculum

<p>not used to build. Discuss why some materials are better than others for house building. (A INQ.9).</p> <ul style="list-style-type: none">• Refer students to discussions about weather and appropriate clothing. Use this, as well as iOPENERS book (<u>Homes Around the World</u>) to start discussions on why different materials are used to build houses in different areas. (A INQ 3).• Using various materials, allow students to experiment with strength and weather appropriateness of materials. Test by blowing on them, dropping water on them, pushing/standing on them, etc. As a whole class draw conclusions about what characteristics/properties materials have that make them good for certain weather conditions, areas, strengths, etc. (A INQ.2).• As a whole class discuss the difference between natural and man made materials showing students real life examples or pictures of materials that fit in each category (iOPENERS <u>Homes Around the World</u>) (A INQ.1,4,9).		
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Seymour Public Schools Curriculum

APPENDIX

Science CMT Handbook ..\Science\science_cmt_handbook.pdf