

ELL CENTER SCIENCE B

Description An inquiry-based science survey course with an emphasis on developing English communication skills and vocabulary relevant to science content. Matter is the focus of “ELL Center Science A” and energy is the focus of “ELL Center Science B”.

Credits

Prerequisites

Textbooks/Resources MacMillan/McGraw – Grade 4

Required Assessments District-Wide Standards-Based Assessment

Board Approved October, 2005
Revised

AASD Science Goals for K-12 Students

- *Students will know about science themes and connect and integrate them into what they know about themselves and the world around them.*
- *Students will realize that scientific knowledge is public, replicable, and continually undergoing revision and refinement based on new experiments and data.*
- *Students will realize that science includes questioning, forming hypotheses, collecting and analyzing data, reaching conclusions, evaluating results, and communicating procedures and findings to others.*
- *Students will use science to explain and predict changes that occur around them.*
- *Students will use science to evaluate consequences in order to make responsible choices.*
- *Students will use their knowledge of science concepts and processes in making informed choices regarding their lifestyles and the impact they have on their environment, and enhance their natural curiosity about their environment.*
- *Students will understand that science and technology affect the Earth’s systems and provide solutions to human problems.*
- *Students will use science to analyze topics related to personal health, environment, and management of resources; they will help evaluate the merits of alternative courses of action.*

AASD Science Standards for Grades K-4 Students

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| I. Science Connections | <ul style="list-style-type: none">A. Conduct science investigations, ask and answer questions that will help decide the general areas of science being addressed.B. Investigate science-related problems and decide what evidence, models, or explanations previously studied can be used for investigation.C. Investigate science-related problems and decide what data can be collected to determine the most useful explanations.D. Decide which science themes are important in investigating a specific science-related problem.E. Decide what changes have occurred when investigating a specific science-related problem. |
| II. Nature of Science | <ul style="list-style-type: none">A. Use references to help answer science-related questions and plan investigations.B. Acquire information about people who have contributed to the development of major ideas in science.C. Show how the major developments of scientific knowledge have changed over time. |
| III. Science Inquiry | <ul style="list-style-type: none">A. Use vocabulary of the unifying themes to ask questions about science.B. Use scientific content being learned to ask questions, plan investigations, make observations, make predictions, and offer explanations.C. Select multiple sources of information to help answer questions selected for classroom investigation.D. Use science equipment safely and effectively to collect data relevant to questions and investigations.E. Use data collected to develop explanations and answer questions generated by investigation.F. Communicate results of investigations in ways audiences will understand.G. Support conclusions with logical arguments.H. Ask additional questions that might help focus or further an investigation.I. Develop record systems to organize and record information. |
| IV. Physical Science | <ul style="list-style-type: none">A. Understand that objects are made of more than one substance.B. Group and/or classify objects and substances based on properties of materials.C. Understand the characteristics of solids, liquids, and gases.D. Observe and describe changes in matter and construct explanations for the changes.E. Construct models of matter undergoing change.F. Observe and describe objects at rest or in motion.G. Discover the characteristics of energy (including light, heat, electricity, sound, and magnetism). |

AASD Science Standards for Grades K-4 Students (continued)

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| V. Earth and Space Science | <ul style="list-style-type: none">A. Investigate and understand components of soil, its origin, and importance to plants and animals.B. Investigate the composition of rocks, minerals, and soils.C. Identify and describe land and water masses.D. Identify the seasons and their characteristics.E. Investigate and understand basic weather found in Wisconsin.F. Find patterns and cycles in the earth's daily, yearly, and long-term changes.G. Describe renewable and nonrenewable resources in the home and community.H. Give examples of resources used in mining, forestry, farming, and manufacturing.I. Identify celestial objects and note changes in their patterns. |
| VI. Life and Environmental Science | <ul style="list-style-type: none">A. Explain the basic needs of organisms.B. Compare plant and animal structures and functions.C. Give examples of plant and animal life cycles.D. Explain that plants and animals grow to resemble the parents.E. Explain how animals depend on plants.F. Relate an organism's pattern of behavior and survival to the nature of that organism's dynamic environment. |
| VII. Science Applications | <ul style="list-style-type: none">A. Identify the benefits of technology used in jobs in Wisconsin.B. Describe technological advances in the workplace over time.C. Determine science discoveries that have led to changes in technologies which are being used in the work place.D. Identify the combinations of simple machines in a commonly used device.E. Ask questions and find answers about how devices and machines were invented and produced. |
| VIII. Science in Social and Personal Perspectives | <ul style="list-style-type: none">A. Describe how science and technology have helped and sometimes hindered progress in state and local issues.B. Show how science has contributed to meeting personal needs.C. Develop a list of issues about which citizens must make decisions and discuss ways of finding information about the issues. |

WIDA English Language Proficiency Standards (Grades 6-8)

Domain	Level 1 Entering	Level 2 Beginning	Level 3 Developing	Level 4 Expanding	Level 5 Bridging
Listening	<ul style="list-style-type: none"> • match science domains or their tools with pictures from oral statements (such as earth, life, or physical science) • match oral statements of scientific facts with illustrations (e.g., “White is made up of all colors.”) 	<ul style="list-style-type: none"> • categorize science domains or their tools with pictures and words from oral directions (such as a telescope and sun dial go with the heavens) • create scientific models based on illustrations and oral directions (e.g., “Show how light or sound travels;” “Show how the earth goes around the sun.”) 	<ul style="list-style-type: none"> • identify science domains or their tools from oral descriptions of examples • classify examples of properties (of light, sound, stars or planets) based on illustrations and oral directions 	<ul style="list-style-type: none"> • compare/contrast examples of science domains or their tools and uses from oral descriptions (such as the difference between telescopes and microscopes) • apply oral descriptions of properties (of light, sound, stars or planets) to everyday life 	<ul style="list-style-type: none"> • give examples of science domains or their tools from oral reading of grade level science text • seek explanations of the properties (of light, sound, stars or planets) through oral scenarios
Speaking	<ul style="list-style-type: none"> • use vocabulary associated with scientific events or discoveries based on illustrations (such as x-rays or vaccines) • chart change over time and offer information from charts or graphs (such as phases of the moon, temperatures, daylight hours) 	<ul style="list-style-type: none"> • describe scientific events or discoveries based on illustrations • describe differences over time based on information from charts or graphs 	<ul style="list-style-type: none"> • compare/contrast scientific events or discoveries described orally with visual support (e.g., “__ is similar/ different from __ because __.”) • compare differences based on information from charts or graphs 	<ul style="list-style-type: none"> • predict future scientific events or discoveries based on oral or graphic evidence (e.g., “__ could/will/may/might/ lead to __.”) • summarize and present information from charts or graphs related to change 	<ul style="list-style-type: none"> • predict the effects of future scientific events or discoveries based on oral evidence (e.g., “__ will/may/ might/make it necessary to __.”) • explain patterns of change over time based on evidence from charts or graphs

<p>Reading</p>	<ul style="list-style-type: none"> match pictures of systems or processes with vocabulary (such as photosynthesis or body systems; e.g., "An example of ___ is ___.") chart time and places of natural disasters (such as hurricanes, tornadoes, floods, typhoons, or earthquakes) based on headlines and pictures 	<ul style="list-style-type: none"> match pictures and phrases descriptive of systems or processes with vocabulary (such as mitosis or the nitrogen cycle; e.g., "___ goes with ___.") respond to WH-questions regarding natural disasters based on graphic organizers and pictures 	<ul style="list-style-type: none"> sort descriptive sentences by systems or steps in the process (such as by sequencing or classifying; e.g., "before, after; goes with and belongs to; is like, is different from...") identify characteristics and conditions related to natural disasters based on text and pictures 	<ul style="list-style-type: none"> identify systems or processes from descriptions from science text (e.g., "As a result of ___; ___ is caused by ___.") compare natural disasters using multiple written sources, including the Internet and graphic organizers 	<ul style="list-style-type: none"> identify functions of systems or processes from grade level science text (e.g., "In order to ____, it is necessary to ____.") interpret impact of natural disasters on people and places from grade level text
<p>Writing</p>	<ul style="list-style-type: none"> identify forms of energy and everyday examples depicted visually (such as light, sound, heat) make posters or label diagrams related to scientific questions (such as force or motion) 	<ul style="list-style-type: none"> describe and draw examples of forms of energy make posters or label diagrams following the scientific method 	<ul style="list-style-type: none"> compare/contrast two forms of energy (e.g., "___ and ___ are alike/different in these ways.") create science exhibits with statements for each step of the scientific method 	<ul style="list-style-type: none"> explain uses of different forms of energy (e.g., "___ is used to ___.") create science exhibits with descriptions of each step of the scientific method 	<ul style="list-style-type: none"> evaluate and defend the most efficient forms of energy (e.g., "The similarities between/among ___ are ___; ___ is ___er than ___.") create science exhibits with explanations of each step of the scientific method

Course Objectives	Performance Indicators	Classroom Assessments
<p>1. When conducting science investigations, ask and answer questions that will help decide the general areas of science being addressed. (A.4.1.)</p>	<p>Performance will be satisfactory when the student:</p> <p>1. identifies the general area(s) of science being addressed in a question.</p>	<p>1.a. In cooperative groups, generate a question and design an experiment. Identify the science domain of this question and experiment.</p> <p>1.b. Ask and answer questions relating to which science domain(s) an experiment and/or investigation represents.</p>
<p>Above objective aligned with AASD Science standards: Science Connections</p>		
<p>2. When faced with a science-related problem, decide what evidence, models, or explanations previously studied can be used to better understand what is happening now. (A.4.2.)</p>	<p>Performance will be satisfactory when the student:</p> <p>1. identifies background knowledge related to a problem.</p>	<p>1.a. Use graphic organizers such as KWHL charts. K= what you know W = what you want to know H = how will you find out L = what you learned</p> <p>1.b. Create a word web or semantic map.</p> <p>1.c. In a small group, generate a problem and specify the necessary steps to solve the problem.</p>
<p>Above objective aligned with AASD Science standards: Science Connections</p>		

Course Objectives	Performance Indicators	Classroom Assessments
<p>3. When investigating a science-related problem, decide what data can be collected to determine the most useful explanations. (A.4.3.)</p>	<p>Performance will be satisfactory when the student:</p> <ol style="list-style-type: none"> 1. determines what data are necessary to solve the problem. 	<ol style="list-style-type: none"> 1.a. Given types of data, choose the data relevant to the problem. 1.b. Discuss the answers to questions generated in a KWHL chart. K = what you know W = what you want to know H = how will you find out L = what you learned
<p>Above objective aligned with AASD Science standards: Science Connections</p>		
<p>4. When studying science-related problems, decide which of the science themes are important. (A.4.4.)</p>	<p>Performance will be satisfactory when the student:</p> <ol style="list-style-type: none"> 1. identifies the science themes. 2. chooses the science themes important to the problem. 	<ol style="list-style-type: none"> 1.a. Given a student-initiated or teacher-initiated demonstration, identify the science theme being displayed. 1.b. Participate in activities to demonstrate each science theme. 2.a. Given a graphic of a problem, identify the science theme(s) important to the science-related problem. 2.b. Match the science theme(s) to given problems.
<p>Above objective aligned with AASD Science standards: Science Connections</p>		

Course Objectives	Performance Indicators	Classroom Assessments
5. Use the vocabulary of the unifying themes to ask questions about objects, organisms, and events being studied. (C.4.1.)	Performance will be satisfactory when the student: <ol style="list-style-type: none"> 1. uses examples to demonstrate the vocabulary of unifying themes. 2. classifies questions related to and using the vocabulary of unifying themes. 	<ol style="list-style-type: none"> 1.a. Complete experiments related to the unifying themes. 1.b. List examples (in pictures, words, or symbols) from the student's own experience related to the unifying themes. 2.a. Sort given questions according to the unifying themes.
Above objective aligned with AASD Science standards: Science Inquiry		
6. Use the science content being learned to ask questions, plan investigations, make observations, make predictions, and offer explanations. (C.4.2.)	Performance will be satisfactory when the student: <ol style="list-style-type: none"> 1. identifies and uses prior knowledge related to content to ask question and plan investigation. 	<ol style="list-style-type: none"> 1.a. Complete a KWHL about science content. K = what you know W = what you want to know H = how will you find out L = what you learned
Above objective aligned with AASD Science standards: Science Inquiry		
7. Use simple science equipment including rulers, balances, graduated cylinders, hand lenses, thermometers, and computers safely and effectively to collect data relevant to questions and investigations. (C.4.4.)	Performance will be satisfactory when the student: <ol style="list-style-type: none"> 1. identifies the use of simple science equipment 2. uses simple science equipment to complete an experiment 	<ol style="list-style-type: none"> 1.a. Given a science problem, find the best equipment to solve the problem 2.a. Measure objects, using a variety of tools (e.g., rulers, string, or paper clips) 2.b. Collect data using simple science equipment safely
Above objective aligned with AASD Science standards: Science Inquiry		

Course Objectives	Performance Indicators	Classroom Assessments
8. Use data they have collected to develop explanations and answer questions generated by investigations. (C.4.5.)	Performance will be satisfactory when the student: 1. applies collected data.	1.a. In groups, use collected data to explain investigations. 1.b. In a teacher-led discussion, form a question relevant to the investigation. 1.c. Based on collected data, answer generated questions.
Above objective aligned with AASD Science standards: Science Inquiry		
9. Communicate the results of their investigations in ways their audiences will understand by using charts, graphs, drawings, written descriptions, and various other means. (C.4.6.)	Performance will be satisfactory when the student: 1. expresses the results of investigation.	1.a. Use visuals to share the results of the student's investigation. 1.b. Lead other students in a demonstration to illustrate results of the student's investigation.
Above objective aligned with AASD Science standards: Science Inquiry		
10. Support their conclusions with logical arguments. (C.4.7.)	Performance will be satisfactory when the student: 1. supports the conclusion.	1.a. Gather questions from the teacher and other students which challenge the student's conclusion. 1.b. Through demonstrations or pictures, defend against the challenges.
Above objective aligned with AASD Science standards: Science Inquiry		

Course Objectives	Performance Indicators	Classroom Assessments
11. Ask additional questions that might help focus or further an investigation. (C.4.8.)	Performance will be satisfactory when the student: 1. identifies two more questions to further an investigation.	1.a. Create a flowchart of the investigation with questions located at the appropriate stages.
Above objective aligned with AASD Science standards: Science Inquiry		
12. Observe, predict and describe changes in form, temperature, color, speed, and direction of objects and construct explanations for the changes. (D.4.4.)	Performance will be satisfactory when the student: 1. observes and predicts changes in form, temperature, color, speed, and direction of objects. 2. describes changes that occur in objects. 3. explains why changes occur.	1.a. Observe and predict changes in water as it freezes, melts, and evaporates. 2.a. List changes (using drawing, word map, or discussion) that occur as water freezes, melts, and evaporates. 3.a. Explain changes through drawings or other visuals.
Above objective aligned with AASD Science standards: Physical Science		
13. Observe and describe physical events in objects at rest or in motion. (D.4.6.)	Performance will be satisfactory when the student: 1. observes and describes objects at rest and in motion.	1.a. Experiment with objects at rest or in motion. 2.a. Construct a demonstration to show the physical events of objects at rest and in motion.
Above objective aligned with AASD Science standards: Physical Science		

Course Objectives	Performance Indicators	Classroom Assessments
<p>14. Ask questions and make observations to discover the differences between matter and energy. (D.4.8.)</p>	<p>Performance will be satisfactory when the student:</p> <ol style="list-style-type: none"> 1. identifies prior knowledge related to the topic. 2. makes observations of the relevant characteristics of variables during experimentation. 	<ol style="list-style-type: none"> 1.a. List things that can be touched and list things that cannot be touched. 2.a. Participate in activities involving things that can be touched and things that cannot be touched. 2.b. Create a visual (e.g., discussion web or Venn diagram) to display the differences between things that can be touched and things that cannot be touched.
<p>Above objective aligned with AASD Science standards: Physical Science</p>		
<p>15. Identify celestial objects (stars, sun, moon, planets) in the sky, noting changes in patterns of those objects over time. (E.4.4.)</p>	<p>Performance will be satisfactory when the student:</p> <ol style="list-style-type: none"> 1. identifies celestial objects in the sky. 2. notes change in patterns of celestial objects over time. 	<ol style="list-style-type: none"> 1.a. Draw pictures of celestial objects. 1.b. Create models of celestial objects. 1.c. Label pictures of celestial objects. 2.a. After visiting a planetarium or watching a video about celestial changes, draw pictures, make models, or create a timeline to show changes over time.
<p>Above objective aligned with AASD Science standards: Earth and Space Science</p>		

Course Objectives	Performance Indicators	Classroom Assessments
<p>16. Describe the weather commonly found in Wisconsin in terms of clouds, temperature, humidity, and forms of precipitation, and the changes that occur over time, including seasonal changes. (E.4.5.)</p>	<p>Performance will be satisfactory when the student:</p> <ol style="list-style-type: none"> 1. describes the weather commonly found in Wisconsin. 2. describes the changes in the weather occurring over time. 	<ol style="list-style-type: none"> 1.a. Keep a journal to describe daily weather. 1.b. Keep a graph or chart of daily weather. 1.c. Use various resources (e.g., the Internet, encyclopedias, and personal experience) to compare weather commonly found in Wisconsin to the weather in the student's native country. 2.a. Using a daily journal or chart, compare weather in different seasons. 2.b. Create a graph to show changes in the weather over time.
<p>Above objective aligned with AASD Science standards: Earth and Space Science</p>		
<p>17. Using the science themes, find patterns and cycles in the earth's daily, yearly, and long-term changes. (E.4.6.)</p>	<p>Performance will be satisfactory when the student:</p> <ol style="list-style-type: none"> 1. finds patterns and cycles in the earth's daily, yearly, and long-term changes. 	<ol style="list-style-type: none"> 1.a. Create a picture, physical model, or other visual to show the patterns or cycles of the earth's changes. 1.b. Identify patterns and cycles in the student's own life experience.
<p>Above objective aligned with AASD Science standards: Earth and Space Science</p>		

Course Objectives	Performance Indicators	Classroom Assessments
18. Using the science themes, describe resources used in the home, community, and nation as a whole. (E.4.7.)	Performance will be satisfactory when the student: <ol style="list-style-type: none"> 1. identifies resources related to science themes. 2. describes resources used in a home. 3. describes resources used in a community. 4. describes resources used in a nation. 	<ol style="list-style-type: none"> 1.a. Brainstorm or complete a KWHL chart to list resources related to science themes. K = what you know W = what you want to know H = how will you find out L = what you learned 2.a. Collect examples from home of resources related to the science themes. 3.a. Observe (through slides, field trips, and class guests) and record resources used in a community which relate to the science themes. 4.a. Using computers, contact other students around the nation to find examples of resources related to the science themes.
Above objective aligned with AASD Science standards: Earth and Space Science		
19. Discover how each organism meets its basic needs for water, nutrients, protection, and energy in order to survive. (F.4.1.)	Performance will be satisfactory when the student: <ol style="list-style-type: none"> 1. identifies the basic needs of organisms. 2. discovers how an organism meets its basic needs. 	<ol style="list-style-type: none"> 1.a. Identify the student's own basic needs. 1.b. Distinguish between survival needs and wants. 2.a. Raise and study an organism from birth to adult stage.
Above objective aligned with AASD Science standards: Life and Environmental Science		

Course Objectives	Performance Indicators	Classroom Assessments
20. Investigate how organisms, especially plants, respond to both internal cues (the need for water) and external cues (changes in the environment). (F.4.2.)	Performance will be satisfactory when the student: <ol style="list-style-type: none"> 1. investigates how plants respond to internal cues. 2. investigates how plants respond to external cues. 	<ol style="list-style-type: none"> 1.a. Record in a journal what happens to plants given different amounts of water. 2.a. Record in a journal what happens to plants kept at different temperatures.
Above objective aligned with AASD Science standards: Life and Environmental Science		
21. Identify the technology used by someone employed in a job or position in Wisconsin and explain how the technology helps. (G.4.1.)	Performance will be satisfactory when the student: <ol style="list-style-type: none"> 1. identifies technology use in Wisconsin. 2. identifies the technology used by someone employed in Wisconsin. 3. explains how technology helps in jobs. 	<ol style="list-style-type: none"> 1.a. Match examples of technology to job. 2.a. Shadow a person in their job and determine technology used. 3.a. Hypothesize and illustrate a certain job's increased difficulty without technology
Above objective aligned with AASD Science standards: Science Applications		
22. Identify the combinations of simple machines in a device used in the home, the workplace, or elsewhere in the community. (G.4.4.)	Performance will be satisfactory when the student: <ol style="list-style-type: none"> 1. identifies simple machines. 2. identifies combinations of simple machines in a device. 	<ol style="list-style-type: none"> 1.a. List simple machines used in the home, the workplace, or elsewhere in the community. 1.b. Group machines according to type. 2.a. Label the simple machines in a given device. 2.b. Collect examples of devices from the home, the workplace, or elsewhere which use combinations of simple machines.
Above objective aligned with AASD Science standards: Science Applications		

Course Objectives	Performance Indicators	Classroom Assessments
23. Ask questions to find answers about how devices and machines were invented and produced. (G.4.5.)	Performance will be satisfactory when the student: <ol style="list-style-type: none"> 1. asks questions about a machine's invention. 2. investigates the invention and production of a certain device or machine. 	<ol style="list-style-type: none"> 1.a. Brainstorm questions about machines used daily. 2.a. Research, using books, the Internet, interview, and native language sources, to discover how a chosen device or machine was invented or produced and present the information to others in a student-chosen form.
Above objective aligned with AASD Science standards: Science Applications		
24. Using the science themes, identify local and state issues that are helped by science and technology, and explain how science and technology can also cause a problem. (H.4.2.)	Performance will be satisfactory when the student: <ol style="list-style-type: none"> 1. identifies an issue at the state or local level. 2. illustrates how science and technology helps a chosen issue. 3. illustrates how science and technology can cause a problem. 	<ol style="list-style-type: none"> 1.a. Gather a variety of local and state issues from resources (e.g., television, newspapers, and people). 2.a. Research an issue using television, newspapers, and native language sources to discover and record how science or technology helped it. 3.a. Research an issue using television, newspapers, and native language sources to discover and record how science or technology caused it.
Above objective aligned with AASD Science standards: Science in Social and Personal Perspectives		

Course Objectives	Performance Indicators	Classroom Assessments
<p>25. Develop a list of issues that citizens must make decisions about and describe a strategy for becoming informed about the science behind these issues. (H.4.4.)</p>	<p>Performance will be satisfactory when the student:</p> <ol style="list-style-type: none"> 1. develops a list of issues about which citizens must make decisions. 2. describes a strategy for becoming informed about the science behind these issues. 	<ol style="list-style-type: none"> 1.a. Make a chart of science-related issues. 2.a. List resources to find information about a chosen issue.
<p>Above objective aligned with AASD Science standards: Science in Social and Personal Perspectives</p>		