

Illinois

Science Goals/Standards/Benchmarks Late Elementary Goals 11, 12, 13

Correlated to AIMS Activities

Illinois State Specific Team

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Illinois State Goals/Standards/Benchmarks

Late Elementary Science

GOAL 11: Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.

A. Know and apply the concepts, principles and processes of scientific inquiry		
11.A.2a Formulate questions on a specific science topic and choose the steps needed to answer the questions.		
11.A.2b Collect data for investigations using scientific process skills including observing, estimating and measuring.		
11.A.2c Construct charts and visualizations to display data.		
11.A.2d Use data to produce reasonable explanations.		
11.A.2e Report and display the results of individual and group investigations.		
Activity	Source	Students will:
Reaction Countdown	5.08	Determine their reaction time by catching a falling metric ruler.
By Golly By Gum	Jaw Breakers and Heart Thumpers	Investigate how the mass of gum is affected by chewing.
By Golly By Gum By Time	Jaw Breakers and Heart Thumpers	Investigate how the mass of gum is affected by the amount of time it is chewed.
Crazy Colloid (Formerly Goo Yuck)	6.01	Investigate the properties of a colloid.
A Disappearing Act	Primarily Earth	Investigate the relationship between surface area and evaporation.
Rain Away	5.07	Observe process of evaporation in containers of different surface areas.
Washers and Dryers	8.02	Investigate water loss in apples.
Water In Apples	4.1; Jaw Breakers and Heart Thumpers	Investigate water loss in apples.
M&M Candies® Count and Crunch	Math + Science A Solution	Determine the numerical frequency of the six colors of M&M Candies®.
M&M Candies® What's in the Bag?	Math + Science A Solution	Explore samples of bags of candies and determine a consistency in packaging.
Cat Scan	7.07	Gain experience in the construction and use of bar graphs, circle graphs, binary tree diagrams and Venn diagrams.
Big Banana Peel	Math + Science A Solution	Determine what percentage of the banana is edible.
Tints and Temps	Popping With Power; 10.01	Investigate how car color affects the inside temperature of the car.
Golden House	Cycles of Knowing and Growing	Observe changes in a pumpkin over time.
Paper Gliders	16.04	Use scientific inquiry skills to explore various types of paper to find the one, which results in the longest glider flight.
A Feast For Yeast	15.01	Observe changes in yeast and gather data to construct reasonable explanations.
Catch a Case of Mold	15.06	Observe how mold grows and the effectiveness of preservatives in preventing the growth of mold.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science

B. Know and apply the concepts, principles and processes of technological design.		
11.B.2a Identify a design problem and propose possible solutions.		
11.B.2b Develop a plan, design a procedure to address the problem identifying constraints (e.g., time, materials, technology).		
11.B.2c Build a prototype of the design using available tools and materials.		
11.B.2d Test the prototype using suitable instruments, techniques, and quantitative measurements to record data.		
11.B.2e Assess test results and the effectiveness of the design using given criteria and noting possible sources of error.		
11.B.2f Report test design, test process and test results.		
Activity	Source	Students will:
Let It Fall	3.02	Observe effects of air resistance and lift on falling objects.
A Pair of Chutes	4.10	Construct parachutes and determine the effects of canopy size on the rate of descent.
Puff Mobiles	Popping with Power	Construct, test, and modify a car to achieve maximum distance.
Bird's Eye View	Finding Your Bearings	Design a new school to scale.
Lighten Up	Finding Your Bearings	Design an energy saving lighting system for their home.
New Plant Discovery	Budding Botanist	Design and make a plant model adapted to a certain environment.
Hot Rods or Cool Tubes	15.02	Explore the amount of mass that can be supported by tubes and rods made of the same material.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science

GOAL 12: Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space science.

A. Know and apply concepts that explain how living things function, adapt and change.		
12.A.2a Describe simple life cycles of plants and animals and the similarities and differences in their offspring.		
Activity	Source	Students will:
My Mealworm	Critters	Observe and identify stages in the life cycle of mealworms.
A Time of Their Own	Cycles of Knowing and Growing	Observe and compare the metamorphoses of butterflies and moths.
Butterfly Cycle Song	Cycles of Knowing and Growing	Sing the song of the life cycle of a butterfly.
Silkworms	Cycles of Knowing and Growing	Observe growth and life cycles of and insect's life cycle.
Exploring Germination	Budding Botanist	Plant a mini-garden and observe and compare germination of mixed seeds.
Look At Me Now!	Cycles of Knowing and Growing	Will investigate changes in their growth.
Grab Bag Garbage	7.07	Observe the changes in various materials over time.
What a Corny Life	Cycles of Knowing and Growing	Observe and compare the visual attributes of Indian corn and the changes.
Observing Bulbs	Cycles of Knowing and Growing	Observe and describe the physical characteristics of a bulb.
Growing Bulbs	Cycles of Knowing and Growing	Observe life cycle of a bulb.
Just a Little Sprout	Cycles of Knowing and Growing	Plant pumpkin seeds and observe the cycle of growth.
Dissect a Seed	Budding Botanist	Dissect and compare a dicot and monocot.
A Snap of Time	Cycles of Knowing and Growing	Observe and compare change of a tree over time.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science

12.A.2b Categorize features as either inherited or learned (e.g., flower color or eye color is inherited; language is learned).		
Activity	Source	Students will:
Unique U	Math+Science: A Solution	Classify and observe similar and different attributes of everyone in the class.
Teddy Bears Come in Pairs	2.05	Conduct an investigation, which simulates Mendel's experiments with plants.
Dealing with Data	Math+Science: A Solution	Collect, graph, and analyze a variety of data.
Trait Combos	6.10	Test combinations of possible outcomes.
Picturing a Dichotomy	9.08	Compare and contrast data about dominant and recessive traits.

B. Know and apply concepts that describe how living things interact with each other and with their environment.		
12.B.2a Describe relationships among various organisms in their environments (e.g., predator/prey, parasite/host, food chains and food webs).		
Activity	Source	Students will:
Life in the Food Chain	Field Detectives	Describe food chains and webs found on the playground and around school.
Pizza Parts and Web Wheels	Field Detectives	Make a small pizza and identify from what parts of the food web the ingredients came from.
Pyramid Pile-Up	Field Detectives	Use a three-dimensional model to show the structure of a food pyramid.
Food Chain of the Pond	8.05	Sing a song about the food chain in a pond.
Catch Me If You Can	Critters	Role-play to experience the relationships between predators and prey in a food chain.
Color Me Safe	Overhead Underfoot	Discover the importance of animal coloring in relation to survival.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science

12.B.2b Identify physical features of plants and animals that help them live in different environments (e.g., specialized teeth for eating certain foods, thorns for protection, insulation for cold temperature).		
Activity	Source	Students will:
Table Manners	Critters	Simulate food gathering with four different types of insects.
Hide 'n Seek	Critters	Create a critter and observe the effects of camouflage.
Food Chains and Webs	9.09	Explore the variety of ways transfer of food energy can occur.
Pages 14-33	Exploring Environments	Explore organisms and identify characteristics of interdependence.
Noses for Nectar	Bats Incredible	Simulate a megabat feeding process to understand bats' roles in pollination.
Missing Moths	Critters	Observe an environment to see the effects of camouflage.
New Plant Discovery	Budding Botanist	Design and make a plant model that is adapted to a certain type of environment.
Where in the World Is Cotton?	15.09	Research and locate on a map where cotton grows and discover a pattern in latitude.
Beat the Heat	16.01	Collect data on various adaptations used by organisms to keep from drying out.
Here's Looking At You	16.04	Use angle measurements to compare their vision with that of an owl's.
Oh Snail Can You See?	16.05	Investigate how a snail/slug uses vision and other senses to get around.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science

C. Know and apply concepts that describe properties of matter and energy and the interactions between them.		
12.C.2a Describe and compare types of energy including light, heat, sound, electrical and mechanical.		
Activity	Source	Students will:
Musical Instruments	Primarily Physics	Create instruments to observe how sound is created by striking, plucking or blowing.
Sound Is Vibration	Primarily Physics	Explore with a variety of objects to observe that sound is vibration.
Traveling Sounds	Primarily Physics	Experiment with different materials to observe how sound travels.
Paper Cup Telephone	Primarily Physics	Demonstrate that sound travels through solids.
Sound of Voices	Primarily Physics	Demonstrate that sound is produced by vocal cords.
Light Sources	Primarily Physics	Investigate sources that produce light energy.
Mirrors Reflect	Primarily Physics	Explore the path of light energy.
Light Rays Slow Down	Primarily Physics	Observe properties of light energy.
What Is Hot/What Is Cold?	Primarily Physics	Explore concepts of hot and cold.
Heat Energy From Friction	Primarily Physics	Realize that rubbing two surfaces together produces heat energy.
Heat Energy and Color	Primarily Physics	Observe that dark colors absorb radiant energy faster than light colors.
Heat Energy Travels	Primarily Physics	Learn that metal can be a good conductor of energy.
Hot Chocolate	13.10	Explore the transfer of heat by conduction.
Polar Brrrs	15.04	Design ways to prevent an ice cube from melting.
Focus Pocus	16.01	Determine the focal lengths of different lenses, the relationship of area and thickness of a lens and its focal length, and how double convex and plano-convex lenses differ.
Inquiring About Lenses	16.02	Create a convex lens and discover its properties.
Cool Colors	16.03	Measure and record temperatures of objects placed in sunlight and explain the relationship between color and temperature.

12.C.2b Describe and explain the properties of solids, liquids and gases.		
Activity	Source	Students will:
The Melting Ice Cube	Off the Wall Science	Observe the change a solid state of matter to a liquid state.
Ice Water in a Tin Can	Off the Wall Science	Observe how cooling affects condensation.
Water Olympics	Water Precious Water	Explore properties of water.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science

A Crazy Colloid	6.01	Observe states of matter.
Messing with Mixtures	12.07	Test different mixtures for separation, evaporation, and distillation
Oh Dear What Can This Matter Be?	16.04	Classify objects according to their physical properties, identify the 3 phases of matter, and use a Venn Diagram.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science

D. Know and apply concepts that describe force and motion and the principles that explain them.		
12.D.2a Explain constant, variable and periodic motions.		
Activity	Source	Students will:
How a Skydiver Flies	Gravity Rules	Duplicate many of the motions of a real skydiver in freefall.
Look At the Moon	Cycles of Knowing and Growing	Describe the changes they see in the moon.
Swinging Bears Part II	Popping With Power	Determine how the length of the pendulum effects the frequency.
Rally Round the Room	Pieces and Patterns	Explore concepts of friction, kinetic energy and distance traveled with an inclined plane.
Tug Teams	11.7	Explore Newton's First Law.

12.D.2b Demonstrate and explain ways that forces cause actions and reactions (e.g., magnets attracting and repelling; objects falling, rolling and bouncing).		
Activity	Source	Students will:
Spheres on a Roll	13.07	Measure and record the direction and distance a variety of spheres roll when given an equal push.
Have a Ball	Popping With Power	Explore physical characteristics of balls and determine which one most influences the height of bounce.
On the Rebound	Popping With Power	Discover a pattern relating the height from which a ball is dropped to the height of its bounce.
From the Ground Up	Popping With Power	Explore how different surfaces effect the height of a bouncing ball.
Ball on a Roll	Popping With Power	Observe how slope affects the distance a ball will roll.
It's Simply Marbleous	Math+Science: A Solution	Describe relationship between slope of an inclined plane and the distance an object will roll.
What Will a Magnet Attract?	Mostly Magnets	Predict and test objects for their magnetic interaction.
Magnetic Tug of War	Mostly Magnets	Quantify magnetic interaction between two ring magnets to determine relationship between attraction and repulsion.
Magnets Apart	Mostly Magnets	Study the changes in magnetic attraction as magnets are separated by cardstock.
What's the Attraction?	Mostly Magnets	Determine the average force of magnetic interaction.
How Close Can You Get?	Mostly Magnets	Quantify the level of observable magnetic interaction between magnets and paperclips and quantify increases when a second or third magnet is added.
Plod and Plot	15.04	Use a compass and metric measuring tape to plot pictures.
Electromagnetic Explorations	15.10	Build a simple electromagnet; use a directional compass to determine orientation of its poles and then reverse the flow of current.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science

E. Know and apply concepts that describe the features and processes of the Earth and its resources.		
12.E.2a Identify and explain natural cycles of the Earth's land, water and atmospheric systems (e.g., rock cycle, water cycle, weather patterns).		
Activity	Source	Students will:
Weather Watch	10.02	Gather hourly weather data from radio, TV or computer and observe weather patterns in a variety of locations.
Moving Raindrops in the Water Cycle	Water Precious Water	Construct a visual aid, which depicts the water cycle.
The Mini Water Cycle	Water Precious Water	Understand the processes of evaporation and condensation.
Ice Breakers	Primarily Earth	Investigate the effects of the freezing of water in simulated model rocks.
It's a Breeze	13.05	Use a ribbon to find wind direction, make observations, and create a wind scale.
Wash-N-Wear Caves	Bats Incredible	Construct a model to simulate the formation of a rock cave by erosive forces.
A Drip on a String	Bats Incredible	Construct model caves and grow stalagmites and stalactites.
Sky Watch	15.08	Observe 3 basic types of clouds and their relationship to certain kinds of weather.
Decimal Downpour	15.09	Use the internet to gather monthly precipitation data and then graph and interpret the data.
An Olympic Latitude	16.06	Locate and plot countries that won most medals in summer and winter games; look for patterns and suggest reasons why latitude may influence the outcome.

12.E.2b Describe and explain short-term and long-term interactions of the Earth's components (e.g., earthquakes, types of erosion).		
Activity	Source	Students will:
Quaking Earth	Primarily Earth	Do two investigations to explore what happens to the surface of Earth and buildings when it quakes.
Agent Erosion	10.3; Primarily Earth	Use models to observe that rocks weather into sand and soil.
Trickle Down Theory	9.03	Observe the infiltration of water through particles with different porosity.
Rain Away	Water Precious Water	Observe the effects of erosion caused by rain on a bare hillside.
Don't Rain Away	Water Precious Water	Observe how vegetation helps control erosion caused by rain.

12.E.2c Identify and classify recyclable materials.		
Activity	Source	Students will:
Let's Recycle	Overhead and Underfoot	Use a recycling project to reinforce concepts concerning collection of data.
Earth Has What We Need	Primarily Earth	Identify renewable and non-renewable resources.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science

F. Know and apply concepts that explain the composition and structure of the universe and Earth's place in it.

12.F.2.a Identify and explain natural cycles and patterns in the solar system (e.g., order of the planets; moon phases; seasons as related to Earth's tilt, one's latitude, and where Earth is in its yearly orbit around the sun).

Activity	Source	Students will:
Facing Up to the Moon	10.08	Observe changing moon phases.
Sun Watchers	Pieces & Patterns	Use the angle of the shadow of a meter stick to learn about the time and construct a sundial watch.
Pasta Parallels	9.06	Discover the relationship between the tilt of the Earth and distribution of sun's rays relating to seasons.
Sunshine	6.01	Investigate, observe, and record number of hours of daylight.
Look at the Moon	Cycles of Knowing & Growing	Will describe the changes in the moon.
Spacing Out the Solar System	Out of This World	Determine the relative distance of planets in order to construct a model solar system.
Weather Watch	10.02	Gather hourly weather information and observe weather patterns over time.

12.F.2.b Explain the apparent motion of the sun and stars.

Activity	Source	Students will:
The Moon Shines Bright	Out of This World	Chart the apparent movement of the moon around the earth.
A Handy Time Piece	9.04	Use shadow cast by their hand to determine the approximate time.
The Sun's Autograph	9.03	Keep track of the sun's apparent movement throughout the year.

12.F.2.c Identify easily recognizable star patterns (e.g., the big Dipper, constellations).

Activity	Source	Students will:
It All Depends on Your Point of View	Out of This World	Discover star patterns in constellations.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science

GOAL 13: Understand the relationships among science, technology and society in historical and contemporary contexts.

A. Know and apply the accepted practices of science.		
13.A.2a Demonstrate ways to avoid injury when conducting science activities (e.g., wearing goggles, fire extinguisher use).		
Activity	Source	Students will:
NA		

13.A.2b Explain why similar investigations may not produce similar results.		
Activity	Source	Students will:
Water in Apples	Jaw Breakers & Heart Thumpers	Explore variations in loss of moisture in differently prepared apples.

13.A.2c Explain why keeping accurate and detailed records are important.		
Activity	Source	Students will:
Water in Apples	Jaw Breakers & Heart Thumpers	Explore variations in loss of moisture in differently prepared apples.

B. Know and apply concepts that describe the interaction between science, technology and society.		
13.B.2a Explain how technology is used in science for a variety of purposes (e.g., sample collection, storage and treatment; measurement; data collection, storage and retrieval; communication of information).		
Activity	Source	Students will:
The Enormous “e”	Magnificent Micro-World Adventures	Measure the field of their microscope at its various powers of magnification.
A Focus on Scopes	Magnificent Micro-World Adventures	Learn the parts, function, and care of a compound microscope.
Trees As a Crop	Our Wonderful World	Be introduced to forestry and learn how trees are measured.
Make Your Own Measuring Cup	Water Precious Water	Calibrate a cup to make their own measuring cup.
Big Banana Peel	Math + Science A Solution; 1.04	Determine what percentage of a banana is edible.
Peddle the Metal	Hardhatting in a Geo-World	Make pasta jewelry and determine the selling price by measuring the number of grams of each piece.
As Light As A Feather	15.04	Make and adjust an equal-arm balance to determine items in their environment that are as light as a feather.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science

13.B.2b Describe the effects on society of scientific and technological innovations (e.g., antibiotics, steam engine, and digital computer).

Activity	Source	Students will:
Let's Recycle	Overhead and Underfoot	Use a recycling project to reinforce concepts concerning collection data.
When I Was Ten	Electrical Connections	Investigate how electrical innovations have impacted human lives.

13.B.2c Identify and explain ways that science and technology influence the lives and careers of people.

Activity	Source	Students will:
Archimedes: A Teeter-Totter Discovery	Historical Connections in Mathematics Vol. I	Develop an understanding of the law of the lever.
Galileo: Galileo Drops the Ball	Historical Connections in Mathematics Vol. I	Understand the law of falling bodies.
Trees As A Crop	Our Wonderful World	Be introduced to forestry and learn how trees are measured.
Magniviewer	9.10	Construct and use a microscope made with a hand lens.

13.B.2d Compare the relative effectiveness of reducing, reusing and recycling in actual situations.

Activity	Source	Students will:
Rain Away	Water Precious Water	Observe the effects of erosion caused by rain on a bare hillside.
Don't Rain Away	Water Precious Water	Observe how vegetation helps control erosion caused by rain.
Bitter Litter	Overhead & Underfoot	Investigate how the environment effects different types of litter.

13.B.2e Identify and explain ways that technology changes ecosystems (e.g., dams, highways, buildings, communication networks, power plants).

Activity	Source	Students will:
Teddy Bears Fight Pollution	2.03	Study the effect of the increasing amount of pollution on animal life through a simulation.
A Warrant for Water	Field Detectives	Test percolation and retention of water for different surface areas.

13.B.2f Analyze how specific personal and societal choices that humans make affect local, regional and global ecosystems (e.g., lawn and garden care, mass transit).

Activity	Source	Students will:
Teddy Bears Fight Pollution	2.03	Study the effect of the increasing amount of pollution on animal life through a simulation.
Compacted Playground	Field Detectives	Study the effect of compacted soil on plant life.
A Warrant for Water	Field Detectives	Test percolation and retention of water for different surface areas.

Illinois State Goals/Standards/Benchmarks

Late Elementary Science