

6TH GRADE SCIENCE CHECKLIST
Goals 11 – 13
Illinois Learning Standards A – F
Performance Descriptors

SCIENTIFIC INQUIRY

- _____ Formulate hypotheses that can be tested by collecting data through use of any of the following:
- _____ Choosing a hypothesis that includes a variable to be tested and a variable to be observed/measured
 - _____ Choosing a hypothesis using an if-then, cause-effect statement
 - _____ Predict an outcome in a hypothesis statement
- _____ Design scientific experiments that control all but one variable by using any of the following:
- _____ Choosing independent/manipulated and dependent/responding variables of a scientific experiment
 - _____ Choosing variables that are kept the same (control) in order to give a “fair” test
 - _____ Select several trials of an experiment
- _____ Collect and record data accurately using consistent measuring and recording techniques and media by using any of the following:
- _____ Recording appropriate units of measurement consistently
 - _____ Manipulating appropriate instruments for gathering data
 - _____ Reading data from collecting instruments and recording accurately
 - _____ Reading data in a table, chart or other appropriate format
- _____ Use data manipulation tools and quantitative and representational methods to analyze measurements by using any of the following:
- _____ Reporting data using data manipulation tools
 - _____ Graphing data appropriately to show relation to variables in hypothesis
- _____ Explain the existence of unexpected results in a data set by using any of the following:
- _____ Recording individual results with group results
 - _____ Recording unexpected data within the data set

- _____ Investigating discrepancies in the data set
- _____ Interpret and represent results of analysis to produce findings by using any of the following:
 - _____ Differentiating observations that support a hypothesis
 - _____ Recording results based on data to produce findings or conclusions
- _____ Report and display the process and results of a scientific investigation by using any of the following:
 - _____ Reporting the process and results of an investigation in an oral and /or written presentation
 - _____ Listing observations that support a hypothesis
 - _____ Analyzing a logical proof or explanation of findings
 - _____ Report results of an investigation using posters, pictures, actual materials, computer graphs, or multi-media
 - _____ List questions for further investigation

TECHNOLOGICAL DESIGN

- _____ Identify an actual design problem and establish criteria for determining the success of a solution by:
 - _____ Discovering a specific need or problem
 - _____ Listing criteria for determining a successful solution
- _____ Sketch, propose, and compare design solutions to the problem considering available materials, tools, cost effectiveness, and safety by:
 - _____ Preparing design solutions to a problem
 - _____ Choosing different design solutions considering given constraints
- _____ Select the most appropriate design and build a prototype or simulation by:
 - _____ Discovering models that solve a problem, satisfy design constraints, and meet established criteria for success
 - _____ Choosing appropriate materials for a design from a prepared list
 - _____ Choosing a prototype, model or simulation
- _____ Test the prototype using available materials, instruments, and technology and recording of the data by:

- _____ Using appropriate strategies such as simulation and trial and error methods to test a model
- _____ Prepare criteria to determine a successful solution of a problem
- _____ Record data accurately over multiple trials
- _____ Evaluate the test results based on established criteria, note sources of error, and recommend improvements by:
 - _____ Recording test results by established test criteria
 - _____ Investigating the results of a test to locate sources of error
 - _____ Listing suggestions for redesigning the test to improve results
- _____ Use available technology to report the relative success of their design, based upon the test results and their testing criteria by:
 - _____ Listing main points of a report of a test design, procedure, and results using available technology
 - _____ Testing appropriate technologies to present results

LIVING THINGS

- _____ Know how cells function as “building blocks” of organisms and describe the requirements for cells to live by:
 - _____ Recognizing how cells work together to keep the organism alive
 - _____ Describing the many functions cells carry on to sustain life
 - _____ Telling how specialized cells perform specialized functions in multi-cellular organisms
 - _____ Listing examples of cells working together to keep the organism alive (tissues, organs)
 - _____ Discovering the many functions cells carry onto sustain life
 - _____ List ways specialized cells perform special functions in multi-cellular organisms
- _____ Know the characteristics of organisms produced from a single parent with those of organisms produced by 2 parents (sexual).
 - _____ Define and compare asexual and sexual reproduction
 - _____ Observe and choose the characteristics of organisms produced by a single parent / by 2 parents

- _____ Recognize and discover how every organism requires a set of instructions for specifying its traits
- _____ Know how different forms and structures reflect different functions by:
 - _____ Match and list the functions of various animal parts such as elephant tusks or feathers on birds to their functions
 - _____ Describe and show how the functions of plant and animal cells are related to their forms and structures
 - _____ Match examples of how changes in form and structure are related to adaptations to changes in the environment and report them
- _____ Know the methods used to identify and classify the biotic and abiotic factors that affect organisms in an environment by studying a local habitat (prairie, forest, school lawn, etc.) and:
 - _____ List biotic and abiotic factors to look for in a habitat
 - _____ Using a simple tool, classification keys/guides or other aid to measure or identify biotic or abiotic factors in a local habitat
 - _____ Complete a food pyramid for a local habitat
 - _____ List different niches and relationships found among organisms and a local habitat
- _____ Know the competitive, adaptive, and survival potential of an organisms characteristics by:
 - _____ Listing survival characteristics of an organism
 - _____ Report how characteristic features of plants and animals help them survive in the environment

MATTER AND ENERGY

- _____ Know the interactions of energy with matter by:
 - _____ Report how interactions of energy and matter affect changes of state
 - _____ Demonstrate how energy interacts with matter to conserve mass and energy
 - _____ Demonstrate how different types of energy are transformed in various situations
- _____ Know the chemical and physical characteristics of matter by:
 - _____ Showing physical and chemical changes of matter

_____ Demonstrating the relationships among atoms, molecules, elements and compounds

_____ Select from a list models or illustrations that show the chemical and physical characteristics of matter

FORCE AND MOTION

_____ Know how forces affect motion by:

_____ Recording how various forces affect motion

_____ Listing Newton's Laws of Motion

_____ Discover how gravity is affected by an object's size and its distance from other objects

_____ Know factors that affect the gravitational forces on objects:

_____ Record factors that affect the gravitational forces on an object

_____ Record how gravity is affected by an object's size and its distance from other objects

EARTH AND ITS RESOURCES

_____ Know the large-scale dynamic forces, events and processes that affect Earth's land, water and atmospheric systems by:

_____ Recording local atmospheric conditions for an extended period of time

_____ Demonstrate the affect of glaciation on a surface (place a large block of ice on a model land surface made of soil)

_____ Know interactions among solid earth, oceans, atmosphere, and organisms that have resulted in ongoing changes of the Earth:

_____ Discovering sources of ongoing changes to the Earth's atmosphere (e.g., global warming)

_____ Reporting about how organisms can cause changes to the Earth

_____ Know how to evaluate the biodegradability of materials that are produced with or made of natural and /or synthetic substances by:

_____ Choosing which natural resources are biodegradable

_____ Report about why using biodegradable materials benefit individuals and the community

_____ Identify the biodegradability of everyday materials

EARTH/SPACE SCIENCES

_____ Know the effects of gravitational force in the solar system (e.g., orbital shape and speed, tides, spherical shape of the planets and moons) by:

_____ Record the gravity of each planet

_____ Research the affect gravity of each planet would have on the weight of objects

_____ Sketch the orbital shapes of the planets

_____ List the effects of the sun and moon's gravity on the tides

_____ Know the organization and physical characteristics of the solar system by:

_____ Record the relative sizes and distances of the planets

_____ Point out the surface and atmospheric conditions of each planet

_____ List the planet's characteristics such as size and composition

_____ Point out differences between the orbits of comets and planets

SCIENCE, SAFETY AND APPLICATION

_____ Indicate knowledge of potential hazards in science activities by:

_____ Demonstrating established safety rules during lab experiments

_____ Handle equipment appropriately and safely

_____ Clean up workspaces and return equipment to the proper locations

_____ Dispose of waste materials properly

_____ Analyze cases in which the work of science has been effected by both valid and biased scientific practices by:

_____ Comparing scientific works that have been affected by both valid and biased practices

_____ Know the similarities and differences between observational and experimental investigations by:

_____ Reporting why more than one possible conclusion can be drawn from observational and experimental phenonmenon

_____ Recording the scientific methods for conducting observational and experimental investigations

SCIENCE, TECHNOLOGY, AND SOCIETY

_____ Know ways that scientific knowledge and economics drive technological development by:

- _____ Discovering how a need can lead to a technological advancement
- _____ Considering how a design leads to many uses
- _____ Know important contributions to science and technology that have been made by individuals and groups from various cultures by:
 - _____ Discovering contributions to science and technology made by women, cultural and ethnic minorities and persons with disabilities
 - _____ Investigating contributions made to science and technology by persons from various cultures
- _____ Know how occupations use scientific and technological knowledge and skills by:
 - _____ Recording a variety of career choices and their relationships to science and technology
- _____ Know the interaction of resource acquisition, technological development, and ecosystem impact by:
 - _____ Comparing technological developments and their impact on an ecosystem
 - _____ Reporting how resources are obtained and what affect this has on the environment
- _____ Know advantages and disadvantages of natural resource conservation and management programs by:
 - _____ Reporting the effects of conservation and management practices
- _____ Know classroom-developed criteria to determine the effects of policies on local science and technology issues by:
 - _____ Discussing classroom-developed criteria to analyze and determine the effectiveness of local policies