

TIMSS 2011

Fourth Grade Science Item Descriptions developed during the TIMSS 2011 Benchmarking

Items at Low International Benchmark (400)

Life Science

S01_01	Recognizes a wolf as a predator
S01_02	Recognizes that fat layers help keep a walrus warm
S01_03	Recognizes that wings are common to bird, bats, and butterflies
S07_07	Recognizes that birds sit on their eggs to keep the eggs warm
S11_01	Completes a table by matching diagrams of animals to their ecosystems
S13_11	States one effect the Sun can have on unprotected skin

Physical Science

S03_01	Identifies wind as the cause of the movement in a sail boat
S06_01	From a diagram, recognizes which thermometer reading shows the highest temperature
S07_08	From a simple circuit diagram, recognizes that an iron nail can complete an electrical circuit
S13_09	Recognizes where the vibrations that produce sound in a guitar originate

Earth Science

NONE

Items at Intermediate International Benchmark (475)

Life Science

S03_08	Describes how influenza can be passed from person to person
S05_02	From a diagram of feet, recognizes the structure of a bird's foot that lives in a pond
S05_05	Recognizes that tadpoles hatch from frogs' eggs
S07_03	Pairs pictures of three animals with their distinguishing biological characteristics (skeleton, milk production, number of legs)
S09_01	Recognizes the organ where digestion takes place
S10_04	Uses a list of living things to complete a food chain
S10_05	Recognizes a benefit of washing hands before eating
S10_06	States one reason why it is important to have spiders in a garden
S11_02	Describes one way people can protect their teeth from decay, in addition to brushing
S13_01	Recognizes that the function of seeds is to produce new plants
S13_02	Recognizes that the body needs more oxygen during exercise
S14_01	Recognizes that in mammals, a male and female of the same kind are needed to reproduce

Physical Science

S01_07	States two things that electricity can be used for in daily life
S02_06	Recognizes the order of ice, water, and steam from coldest to hottest
S02_07	Recognizes that the image of the Sun in a lake results from sunlight reflecting off of water
S05_07	Recognizes that salt water is a mixture
S05_08	From a list of common materials, indicates which of them will burn
S06_07	Identifies electricity as the energy source for three household objects
S10_07	Recognizes that the strength of steel makes it a better building material than wood
S11_06	Identifies ice as the solid form of water
S12_08	Gives a reason why two objects of same shape and size travel different distances after a push
S12_09	In the context of a model of a flashlight, recognizes that a metal coin completes a circuit
S13_07	Identifies the direction of the force of Earth's gravity in a diagram
S14_09	Recognizes that a metal key is the hidden part of a complete electric circuit

Earth Science

S06_10	States one form of energy Earth receives from the sun
S08_10	Matches each item in a list of Earth's landscape features to its description
S09_11	States two planets other than Earth that orbit the sun
S10_12	Provides evidence for the existence of air inside a balloon

Items at High International Benchmark (550)**Life Science**

S02_01	Names the body part that pumps blood and the body part that is used for thinking
S02_03	Given a list of four animals, recognizes which ones have a backbone and which ones do not
S03_03	From a picture of a pond ecosystem, identifies three living and three non-living things
S03_06	Explains why traveling by bicycle is better for the environment than traveling by motorbike
S04_01	Recognizes the mammal from among four pictures of animals
S04_02	States two changes which occur in the body during running in addition to feeling hot
S04_04	Recognizes how having coloring similar to their surroundings helps some birds stay alive
S05_04	Recognizes that in pictures of two pairs of eyes the smaller pupil sizes are due to brighter light
S06_02	Recognizes that plants use energy from the Sun to make food
S06_03	States one thing a person can do to avoid catching the flu from an infected person
S06_04	From a diagram of a food chain, identifies a predator-prey relationship
S07_02	Recognizes that if the only remaining animals of a rare species are female, they will not be able to reproduce, and will die out
S08_01	States one difference between living things and nonliving things
S08_03	Recognizes an advantage of thin pointed leaves compared to broad flat leaves
S08_04	States one reason why plastic objects in the ocean are dangerous for sea animals
S08_05	Provides a reason why some trees in a group do not grow as well as others
S09_02	Recognizes the part of a flowering plant shown in a diagram that produces seeds
S10_01	Recognizes that standing water provides an environment in which mosquitoes lay eggs
S12_03	Recognizes whether or not labeled features of a bird are inherited

S13_06	From a list of five diverse human activities, identifies five activities which have positive and which have negative effects on the environment
S14_05	Recognizes that the description of a procedure illustrates that the function of a plant stalk is to carry water through the plant

Physical Science

S01_05	From a table showing the results of an experiment, identifies what was being studied in the experiment
S03_10	From a table of properties of two materials, determines the identity of each
S04_08	Given a list of five everyday objects, identifies which ones conduct electricity and which do not
S05_10	From a diagram showing two magnets on carts with the magnet poles marked, describes what happens to the carts when they are moved close together and let go
S06_09	Justifies that objects with more volume do not necessarily weigh more using a diagram of three objects of different materials ordered by volume
S06_11	From a diagram, recognizes the direction of a shadow
S07_04	Recognizes that fine salt dissolves faster in water than coarse salt and explains why
S07_05	Recognizes that a metal spoon in hot soup feels hotter than a wooden spoon in hot soup because metal conducts heat better than wood
S07_09	Recognizes that gravity causes an object to fall to the ground
S08_07	Identifies a difference between ice and water in addition to their states
S08_09A	Recognizes what causes a shadow to be formed
S09_09B	In a description of an investigation, explains that candy dissolves faster in hot water than in cold
S10_08	Identifies from a list which are sources of energy and which are not
S11_04	Recognizes what causes a shadow to be formed
S11_11	Identifies the orientation of the poles on two repelling magnets
S12_06	States a reason for the color change and surface roughening of a metal object over time
S13_12	Names a source of energy other than coal, oil, or natural gas that is used to produce electricity
S14_07	Recognizes that if two metals repel each other, both must be magnets
S14_08	Recognizes and explains that heat transferred through metal reaches a point that is closer to the heat source in a shorter time

Earth Science

S01_10	Identifies the Earth, Moon, and Sun from a diagram of their orbits
S03_13A	Describes one advantage of farming near a river
S04_10	Recognizes that when water disappears from a surface it goes into the air
S04_11	Recognizes that fossils of shellfish indicate the area used to be under water
S04_12	Recognizes that shadows are shortest at midday
S06_13	Recognizes that water that has had its salt removed so that it can be used as drinking water most likely came from the sea
S10_11	Recognizes that water flows from mountains to oceans via rivers
S11_14	From a table showing temperature and cloud cover at different locations, identifies the place where it is most likely to snow
S12_10	Recognizes that an observation of low clouds can lead to a conclusion about their composition
S12_11	Recognizes that the moon's shape looks different at different times of the month
S13_08	Recognizes that parts of animals that have hardened into rock are the best evidence that there were many kinds of animals on Earth that no longer exist today
S14_11	Recognizes that the solar system is made up of the sun and its planets

Items at Advanced International Benchmark (625)

Life Science

S01_04	States one thing that can cause the temperature of the human body to be higher than normal
S01_11	Describes two human activities that can lead to the extinction of animals
S02_02	Recognizes how rolling into a ball helps a hedgehog under threat
S02_04	Recognizes why many desert animals are more active at night
S02_05	States that calcium is needed for bone growth
S03_04	From a diagram of a flowering plant, identifies numbered parts and states a function of most of these parts
S03_09	Describes how migration increases the survival of birds
S04_05	From a list of statements, recognizes characteristics of predators and prey
S05_01	Recognizes from a list of foods that cheese is the best source of calcium
S07_01	Recognizes from a list of animals that the young form of humans looks most like the adult form
S09_03	Recognizes the body covering that protects a reptile
S09_06	Recognizes an animal that is classified as a mammal
S10_02	Describes two ways pollen is spread from flower to flower
S11_07	Explains why people should drink a lot of liquid every day
S11_09	Describes one physical change that can take place in a mammal as the weather gets colder
S12_01	Recognizes that a function of muscles is to move bones
S12_04	Explains that to test if plants need light to grow, plants in a light place should be compared with plants in a dark place
S13_03	Recognizes examples of animals that take care of their young
S13_04	Recognizes how being poisonous to birds is an advantage to monarch butterflies
S14_02	Explains that sneezing transmits germs even when a person does not appear to be sick
S14_03B	Identifies a cactus as a desert plant and describes one feature that helps it survive in the desert
S14_04	Names two things in addition to water that animals need to survive

Physical Science

S01_06	Recognizes the diagram that best shows how ice floats in water
S01_08	Recognizes that heat needs to be supplied for melting and boiling but not for freezing
S02_08	Explains that a bulb will not light in an incomplete electrical circuit
S02_09	Infers that magnets have different strengths from an observation of magnets attracting pins from two different distances
S02_10	Recognizes from two diagrams of children on seesaws where a child should sit in order to balance a child of the same weight and to balance a child of twice his weight
S03_02	Distinguishes objects that produce their own light from those that do not
S03_12	From a description of a demonstration including a series of diagrams, identifies an unknown material as a gas based on its behavior in a closed container and justifies the answer
S04_07	Recognizes the property used to classify everyday objects into two groups
S04_09	Names the force that moves an object down a sloping track
S06_08	From a series of diagrams providing pairwise information about the weights of four cubes, draws a conclusion about the relative weight of one of the cubes
S07_06	Names one thing that shows that sunlight is made up of different colors
S08_08	Recognizes the temperature at which an object melts depends on the material from which it is made
S08_09B	Recognizes that red light produces a black shadow
S09_09A	In a description of an investigation, explains that candy dissolves faster when it is crushed into small pieces
S09_09C	In a description of an investigation, recognizes that more water in a solution makes a drink less sweet

S09_10	Recognizes the best conductor of heat in a list of materials
S10_10	Explains how a sweater can keep a bottle of water cold
S11_03	Using information in a table about physical properties of everyday items, recognizes another item whose physical properties match those of one of the items in the table
S13_13	Recognizes that burning results in new substances
S14_06	Recognizes that two objects of the same size and shape have the same volume and, from a diagram of the objects on a balance, that they have different masses

Earth Science

S01_09	Recognizes that soil rich in decaying plants and animals helps plants grow
S03_11	Recognizes how long it takes for Earth to rotate on its axis
S03_13B	Describes one disadvantage of farming near a river
S05_03	Describes two things people can do to avoid wasting water
S06_12	Recognizes that the direction a river flows depends on the slope of the land
S07_11	Recognizes a soil change due to natural causes
S08_11	Recognizes how fish fossils are formed
S09_12	From a diagram showing a shadow at different times of the day, explains why the shadow changed
S11_12	Recognizes how long it takes for Earth to orbit the sun
S11_13	States two things that make up Earth's crust
S12_12	From a diagram of the Earth and the Sun, describes how the turning on its axis causes day and night in a particular location
S14_10	Recognizes that water covers most of Earth's surface

Items Above Advanced International Benchmark

Life Science

S03_05	Recognizes a group of animals that contains only reptiles
S03_07	Recognizes that protecting seeds is one function of fruit
S04_03	Explains that the same type of plants should be compared when investigating plant growth with or without fertilizer
S06_06A	From a diagram of a tiger skull, identifies a function of the canines
S06_06B	From a diagram of a rat skull, identifies a function of the incisors
S08_06	Recognize that air pollution in a city can be decreased by more use of public buses
S09_04	From a list of plants and animals, recognizes all of those that make their own food
S09_05	States one thing necessary to maintain good physical health and explains why it is necessary
S10_03	Explains why laying a large number of eggs helps frogs survive in their environment
S11_05	States two characteristics that living things share, other than a need for water
S12_02	Recognizes the main function of leaves on a plant
S12_05	Recognizes that a function of feathers is to keep a body warm and applies it to the case of dinosaurs
S14_03A	Explains that to test which plants can survive in a dry place, the plants should be compared under different water conditions

Physical Science

S04_06	Explains that cooking causes a change that cannot be reversed
S05_09	Recognizes changes in temperature when a hot object is put into cold water
S06_05	Recognizes a description of condensation

S09_08	Given two electric circuits diagrams, explains the orientation of two batteries in series that allows a bulb to light
S12_07	Explains why a metal spoon in hot soup feels hotter than a wooden spoon in hot soup
S13_05	Labels the freezing point of water on a diagram of a thermometer

Earth Science

S02_11	Recognizes that falling water can be used to produce electricity
S02_12	Recognizes that fossilized plants were alive about one million years ago
S05_11	Recognizes day and night on Earth is due to rotation on its axis
S07_10	States two ways air is used by humans
S13_10	Explains why water does not fill a glass inverted in water (referring to air in the glass) but does fill it when the glass is tilted (referring to air escaping) in the context of an investigation
