

Science Word List

English–Japanese Vocabulary for New York Grades 9–12

Purpose. This list supports Japanese-speaking students and families learning high school science vocabulary in Grades 9–12. It covers biology, chemistry, physics, Earth and space science, and scientific investigation and engineering.

How to use it. Begin with the **Core** terms for reading, labs, and evidence-based explanation, then add the Useful terms as students analyze systems, interpret models, and explain more advanced scientific relationships.

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Term count by area

Area	Terms
Life Science	37
Chemistry	30
Physics	28
Earth and Space Science	20
Scientific Inquiry and Engineering	13
Total	128

Life Science

English	日本語	よみ	Grade	Priority	Student note / use
gene expression	遺伝子発現	いでんしはつげん	9-12	Core	process by which information in DNA is used to make functional products such as proteins
organelle	細胞小器官	さいぼうしょうきかん	9-12	Useful	structure inside a cell with a specific function
nucleus	核	かく	9-12	Core	cell structure containing genetic material
cell membrane	細胞膜	さいぼうまく	9-12	Core	barrier controlling what enters and leaves a cell
cellular respiration	細胞呼吸	さいぼうこきゅう	9-12	Useful	series of reactions through which cells release usable energy from food molecules
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RNA	アールエヌエー	あーるえぬえー	9-12	Useful	molecule involved in gene expression and protein synthesis
transcription	転写	てんしゃ	9-12	Core	process of making RNA from a DNA template
chromosome	染色体	せんしょくたい	9-12	Useful	structure containing DNA and proteins
protein synthesis	タンパク質合成	たんぱくしつごうせい	9-12	Useful	process of building proteins from genetic instructions
homeostasis	恒常性	こうじょうせい	9-12	Core	maintenance of stable internal conditions
diffusion	拡散	かくさん	9-12	Useful	movement of particles from high to low concentration
trait	形質	けいしつ	9-12	Core	observable characteristic of an organism
allele	対立遺伝子	たいりついでんし	9-12	Useful	alternative form of a gene
genotype	遺伝子型	いでんしがた	9-12	Useful	genetic makeup of an organism
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dominant trait	優性形質	ゆうせいけいしつ	9-12	Core	trait expressed when at least one dominant allele is present
recessive trait	劣性形質	れっせいけいしつ	9-12	Core	trait expressed only when two recessive alleles are present
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natural selection	自然選択	しぜんせんたく	9-12	Core	process in which advantageous traits become more common
adaptation	適応	てきおう	9-12	Core	trait that increases survival or reproduction
common ancestor	共通祖先	きょうつうそせん	9-12	Useful	earlier organism from which different species evolved

ecosystem	生態系	せいたいけい	9-12	Core	community of organisms and their environment
population dynamics	個体群動態	こたいぐんどうたい	9-12	Core	changes in population size and structure over time in response to interacting factors
carrying capacity	環境収容力	かんきょうしゅうようりょく	9-12	Useful	maximum population an environment can support
producer	生産者	せいさんしゃ	9-12	Core	organism that makes its own food
ecological niche	生態的地位	せいたいてきちい	9-12	Core	role of an organism in its environment including resource use interactions and conditions for survival
decomposer	分解者	ぶんかいしゃ	9-12	Core	organism that breaks down dead matter
biogeochemical cycle	生物地球化学的循環	せいぶつちきゅうかがくてきじゅんかん	9-12	Core	movement of matter through living systems the atmosphere water and land
trophic level	栄養段階	えいようだんかい	9-12	Useful	position in a feeding hierarchy
energy transfer	エネルギー移動	えねるぎーいどう	9-12	Core	movement of energy through a system
matter cycle	物質循環	ぶっしつじゅんかん	9-12	Useful	movement of matter through living and nonliving parts of Earth
ATP	ATP	えーていーピー	9-12	Useful	molecule that stores and transfers energy in cells
enzyme	酵素	こうそ	9-12	Core	protein that speeds up a chemical reaction in living systems
punnett square	パネット方眼	ぱねっとほうがん	9-12	Useful	diagram used to predict genetic outcomes
speciation	種分化	しゅぶんか	9-12	Useful	formation of new species over time
keystone species	重要種	じゅうようしゅ	9-12	Useful	species with a large effect on ecosystem structure relative to its abundance

Chemistry

English	日本語	よみ	Grade	Priority	Student note / use
stoichiometry	化学量論	かがくりょうろん	9-12	Core	quantitative relationship between reactants and products in a chemical reaction
electron configuration	電子配置	でんしはいち	9-12	Core	arrangement of electrons in energy levels and orbitals around an atom
proton	陽子	ようし	9-12	Useful	positively charged particle in the nucleus
neutron	中性子	ちゅうせいし	9-12	Useful	neutral particle in the nucleus
electron	電子	でんし	9-12	Useful	negatively charged particle around the nucleus

element	元素	げんそ	9-12	Core	pure substance made of one kind of atom
periodic table	周期表	しゅうきひょう	9-12	Core	chart organizing elements by atomic structure and properties
molar mass	モル質量	もるしつりょう	9-12	Core	mass of one mole of a substance used in chemical calculations
molecule	分子	ぶんし	9-12	Core	group of atoms bonded together
ionic bond	イオン結合	いおんけつごう	9-12	Useful	attraction between oppositely charged ions
covalent bond	共有結合	きょうゆうけつごう	9-12	Useful	bond formed by sharing electrons
chemical formula	化学式	かがくしき	9-12	Core	symbolic representation of a substance
chemical reaction	化学反応	かがくはんのう	9-12	Core	process in which substances change into new substances
reactant	反応物	はんのうぶつ	9-12	Core	starting substance in a chemical reaction
product	生成物	せいせいぶつ	9-12	Core	substance formed in a chemical reaction
conservation of mass	質量保存	しつりょうほぞん	9-12	Core	principle that mass is not created or destroyed in ordinary reactions
balanced equation	平衡化学反応式	へいこうかがくはんのうしき	9-12	Useful	equation showing equal numbers of atoms on both sides
equilibrium	平衡	へいこう	9-12	Core	state in which forward and reverse reactions occur at equal rates
solution	溶液	ようえき	9-12	Useful	homogeneous mixture of substances
concentration	濃度	のうど	9-12	Useful	amount of solute in a given amount of solution
endothermic reaction	吸熱反応	きゅうねつはんのう	9-12	Useful	reaction that absorbs energy
exothermic reaction	発熱反応	はつねつはんのう	9-12	Useful	reaction that releases energy
activation energy	活性化エネルギー	かっせいかえねるぎー	9-12	Useful	minimum energy needed to start a reaction
catalyst	触媒	しょくばい	9-12	Useful	substance that speeds up a reaction without being used up
valence electron	価電子	かでんし	9-12	Core	electron in the outer energy level that affects bonding
electronegativity	電気陰性度	でんきいんせいど	9-12	Useful	tendency of an atom to attract shared electrons in a bond
molecular geometry	分子の立体構造	ぶんしのりったいこうぞう	9-12	Useful	three-dimensional arrangement of atoms in a molecule
reaction rate	反応速度	はんのうそくど	9-12	Useful	speed at which reactants change into products
pH scale	pH 尺度	ぴーえいちしゃくど	9-12	Core	scale used to describe how acidic or basic a solution is

neutralization	中和	ちゅうわ	9-12	Useful	reaction in which an acid and a base produce water and a salt
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Physics

English	日本語	よみ	Grade	Priority	Student note / use
displacement	変位	へんい	9-12	Core	change in position described by distance and direction from a starting point
position	位置	いち	9-12	Core	location of an object relative to a reference point
vector quantity	ベクトル量	べくとるりょう	9-12	Core	measurement described by both magnitude and direction
kinematics	運動学	うんどうがく	9-12	Core	study of motion using position velocity and acceleration without focusing on causes
Newton's second law	ニュートンの第二法則	にゅーとんのだいにほうそく	9-12	Core	relationship showing how net force mass and acceleration are connected
net force	合力	ごうりょく	9-12	Useful	overall force acting on an object
inertia	慣性	かんせい	9-12	Useful	tendency of an object to resist changes in motion
mass	質量	しつりょう	9-12	Core	measure of the amount of matter in an object
gravitational field	重力場	じゅうりょくば	9-12	Core	region around a mass where another mass experiences gravitational force
friction	摩擦	まさつ	9-12	Useful	force opposing motion between surfaces
momentum	運動量	うんどうりょう	9-12	Useful	quantity of motion related to mass and velocity
Newton's laws	ニュートンの法則	にゅーとんのほうそく	9-12	Useful	laws describing motion and forces
energy	エネルギー	えねるぎー	9-12	Core	ability to cause change or do work
mechanical energy	力学的エネルギー	りきがくてきえねるぎー	9-12	Core	total energy associated with motion and position in a system
gravitational potential energy	重力による位置エネルギー	じゅうりょくによるいちえねるぎー	9-12	Core	stored energy due to an object's position in a gravitational field
conservation of energy	エネルギー保存	えねるぎーほぞん	9-12	Core	principle that total energy remains constant in a closed system
work	仕事	しごと	9-12	Useful	energy transfer when a force moves an object
power	仕事率	しごとりつ	9-12	Useful	rate at which work is done or energy is transferred
wave	波	なみ	9-12	Core	disturbance that transfers energy

wavelength	波長	はちょう	9-12	Useful	distance between matching points on consecutive waves
frequency	振動数	しんどうすう	9-12	Useful	number of wave cycles per unit time
amplitude	振幅	しんぶく	9-12	Useful	maximum displacement from the equilibrium position
electromagnetic wave	電磁波	でんじは	9-12	Useful	wave that can travel through empty space
light	光	ひかり	9-12	Core	visible electromagnetic radiation
free-body diagram	自由物体図	じゆうぶつたいず	9-12	Useful	sketch showing the forces acting on an object
impulse	力積	りきせき	9-12	Useful	effect of a force acting over a period of time that changes momentum
mechanical advantage	機械的有利さ	きかいてきゆうりさ	9-12	Useful	how much a machine multiplies an input force
refraction	屈折	くっせつ	9-12	Useful	bending of a wave as it enters a different medium

Earth and Space Science

English	日本語	よみ	Grade	Priority	Student note / use
system interaction	システム間相互作用	しすてむかんそうごさよう	9-12	Core	way Earth spheres influence one another through exchanges of matter and energy
atmospheric circulation	大気循環	たいきじゅんかん	9-12	Core	large-scale movement of air that redistributes heat and moisture around the planet
hydrosphere	水圏	すいけん	9-12	Useful	all water on Earth
geosphere	地圏	ちけん	9-12	Useful	solid Earth including rocks and soil
feedback loop	フィードバックループ	ふいーどばっくるーぷ	9-12	Useful	process in which an effect influences the system that produced it and can amplify or reduce change
carbon cycle	炭素循環	たんそじゅんかん	9-12	Core	movement of carbon through Earth systems
greenhouse gas	温室効果ガス	おんしつこうかがす	9-12	Core	gas that traps heat in the atmosphere
radiative forcing	放射強制力	ほうしゃきようせいりょく	9-12	Core	change in Earth's energy balance caused by factors such as greenhouse gases or solar variation
climate model	気候モデル	きこうもでる	9-12	Useful	representation used to explain or predict climate behavior
plate boundary	プレート境界	ぷれーときょうかい	9-12	Core	region where tectonic plates meet and interact through collision separation or sliding

rock cycle	岩石循環	がんせきじゅんかん	9-12	Useful	continuous transformation of rocks among igneous sedimentary and metamorphic forms
sediment transport	土砂移動	どしゃいどう	9-12	Useful	movement of particles by water wind ice or gravity from one place to another
orbital mechanics	軌道力学	きどうりきがく	9-12	Core	study of how gravity and motion determine the paths of objects in space
cosmic scale	宇宙的尺度	うちゅうてきしゃくど	9-12	Core	immense size relationships among objects and distances in the universe
cosmology	宇宙論	うちゅうろん	9-12	Core	scientific study of the origin structure and evolution of the universe
light-year	光年	こうねん	9-12	Useful	distance light travels in one year
albedo	アルベド	あるべど	9-12	Useful	fraction of incoming light reflected by a surface
seismic wave	地震波	じしんは	9-12	Core	wave of energy produced by an earthquake
red shift	赤方偏移	せきほうへんい	9-12	Useful	stretching of light toward longer wavelengths from objects moving away
stellar evolution	恒星進化	こうせいしんか	9-12	Useful	life cycle and changes of a star over time

Scientific Inquiry and Engineering

English	日本語	よみ	Grade	Priority	Student note / use
causal explanation	因果的説明	いんがてきせつめい	9-12	Core	account showing how and why one factor produces changes in another
independent variable	独立変数	どくりつへんすう	9-12	Core	factor changed on purpose
dependent variable	従属変数	じゅうぞくへんすう	9-12	Core	factor measured in response
control variable	制御変数	せいぎょへんすう	9-12	Useful	factor kept constant for a fair test
data set	データ集合	でーたしゅうごう	9-12	Core	organized collection of measurements or observations used for analysis
empirical evidence	実証的証拠	じっしょうてきしょうこ	9-12	Core	observational or experimental information used to justify a scientific claim
claim	主張	しゅちょう	9-12	Core	statement supported by evidence and reasoning
computational model	計算モデル	けいさんもでる	9-12	Core	digital or mathematical representation used to simulate and analyze a system or process

engineering design	工学設計	こうがくせっけい	9-12	Core	process of defining problems and creating solutions
design trade-off	設計上のトレードオフ	せっけいじょうのとれーどおふ	9-12	Useful	balance between competing design priorities where improving one feature may reduce another
error analysis	誤差分析	ごさぶんせき	9-12	Core	study of uncertainty and possible sources of error in data
peer review	査読	さどく	9-12	Useful	evaluation of scientific work by other experts before publication or acceptance
replicate	再現する	さいげんする	9-12	Core	repeat a procedure or study to check whether results are consistent

Chemistry (sorted)

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chemical formula	化学式	かがくしぎ	9-12	Core	symbolic representation of a substance
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speciation	種分化	しゅぶんか	9-12	Useful	formation of new species over time
trait	形質	けいしつ	9-12	Core	observable characteristic of an organism

Physics (sorted)

English	日本語	よみ	Grade	Priority	Student note / use
amplitude	振幅	しんぷく	9-12	Useful	maximum displacement from the equilibrium position
conservation of energy	エネルギー保存	えねるぎーほぞん	9-12	Core	principle that total energy remains constant in a closed system
electromagnetic wave	電磁波	でんじは	9-12	Useful	wave that can travel through empty space
energy	エネルギー	えねるぎー	9-12	Core	ability to cause change or do work
frequency	振動数	しんどうすう	9-12	Useful	number of wave cycles per unit time
gravitational potential energy	重力による位置エネルギー	じゅうりょくによるいちえねるぎー	9-12	Core	stored energy due to an object's position in a gravitational field
light	光	ひかり	9-12	Core	visible electromagnetic radiation
mechanical advantage	機械の有利さ	きかいてきゆうりさ	9-12	Useful	how much a machine multiplies an input force
mechanical energy	力学的エネルギー	りきがくてきえねるぎー	9-12	Core	total energy associated with motion and position in a system
power	仕事率	しごとりつ	9-12	Useful	rate at which work is done or energy is transferred
refraction	屈折	くっせつ	9-12	Useful	bending of a wave as it enters a different medium
wave	波	なみ	9-12	Core	disturbance that transfers energy
wavelength	波長	はちょう	9-12	Useful	distance between matching points on consecutive waves
work	仕事	しごと	9-12	Useful	energy transfer when a force moves an object
displacement	変位	へんい	9-12	Core	change in position described by distance and direction from a starting point
free-body diagram	自由物体図	じゆうぶつたいず	9-12	Useful	sketch showing the forces acting on an object
friction	摩擦	まさつ	9-12	Useful	force opposing motion between surfaces

gravitational field	重力場	じゅうりょくば	9-12	Core	region around a mass where another mass experiences gravitational force
impulse	力積	りきせき	9-12	Useful	effect of a force acting over a period of time that changes momentum
inertia	慣性	かんせい	9-12	Useful	tendency of an object to resist changes in motion
kinematics	運動学	うんどうがく	9-12	Core	study of motion using position velocity and acceleration without focusing on causes
mass	質量	しつりょう	9-12	Core	measure of the amount of matter in an object
momentum	運動量	うんどうりょう	9-12	Useful	quantity of motion related to mass and velocity
net force	合力	ごうりょく	9-12	Useful	overall force acting on an object
Newton's laws	ニュートンの法則	にゅーとんのほうそく	9-12	Useful	laws describing motion and forces
Newton's second law	ニュートンの第二法則	にゅーとんのだいにほうそく	9-12	Core	relationship showing how net force mass and acceleration are connected
position	位置	いち	9-12	Core	location of an object relative to a reference point
vector quantity	ベクトル量	べくとるりょう	9-12	Core	measurement described by both magnitude and direction

Scientific Inquiry and Engineering (sorted)

English	日本語	よみ	Grade	Priority	Student note / use
causal explanation	因果の説明	いんがてきせつめい	9-12	Core	account showing how and why one factor produces changes in another
claim	主張	しゅちょう	9-12	Core	statement supported by evidence and reasoning
computational model	計算モデル	けいさんもでる	9-12	Core	digital or mathematical representation used to simulate and analyze a system or process
control variable	制御変数	せいぎょへんすう	9-12	Useful	factor kept constant for a fair test
data set	データ集合	でーたしゅうごう	9-12	Core	organized collection of measurements or observations used for analysis
dependent variable	従属変数	じゅうぞくへんすう	9-12	Core	factor measured in response
design trade-off	設計上のトレードオフ	せっけいじょうのとれーどおふ	9-12	Useful	balance between competing design priorities where improving one feature may reduce another

empirical evidence	実証的証拠	じっしょうてきしょうこ	9-12	Core	observational or experimental information used to justify a scientific claim
engineering design	工学設計	こうがくせっけい	9-12	Core	process of defining problems and creating solutions
error analysis	誤差分析	ごさぶんせき	9-12	Core	study of uncertainty and possible sources of error in data
independent variable	独立変数	どくりつへんすう	9-12	Core	factor changed on purpose
peer review	査読	さどく	9-12	Useful	evaluation of scientific work by other experts before publication or acceptance
replicate	再現する	さいげんする	9-12	Core	repeat a procedure or study to check whether results are consistent