

# 500

---

---

## 500 Natural sciences and mathematics

Natural sciences: sciences that deal with matter and energy, or with objects and processes observable in nature

Class here interdisciplinary works on natural and applied sciences

Class natural history in 508. Class scientific principles of a subject with the subject, plus notation 01 from Table 1, e.g., scientific principles of photography 770.1

*For government policy on science, see 338.9; for applied sciences, see 600*

*See Manual at 231.7 vs. 213, 500, 576.8; also at 338.9 vs. 352.7, 500; also at 500 vs. 001*

### SUMMARY

500.2–.8	[Physical sciences, space sciences, groups of people]
501–509	Standard subdivisions and natural history
510	Mathematics
520	Astronomy and allied sciences
530	Physics
540	Chemistry and allied sciences
550	Earth sciences
560	Paleontology
570	Biology
580	Plants
590	Animals

#### .2 Physical sciences

*For astronomy and allied sciences, see 520; for physics, see 530; for chemistry and allied sciences, see 540; for earth sciences, see 550*

#### .5 Space sciences

*For astronomy, see 520; for earth sciences in other worlds, see 550. For space sciences aspects of a specific subject, see the subject, plus notation 091 from Table 1, e.g., chemical reactions in space 541.390919*

*See Manual at 520 vs. 500.5, 523.1, 530.1, 919.9*

#### .8 Groups of people

Add to base number 500.8 the numbers following —08 in notation 081–089 from Table 1, e.g., women in science 500.82

## 501 Philosophy and theory

Class scientific method as a general research technique in 001.4; class scientific method applied in the natural sciences in 507.2

## 502 Miscellany

**.8 Auxiliary techniques and procedures; apparatus, equipment, materials**

Including microscopy; microscopes; interdisciplinary works on microscopy

Class stereology with compound microscopes, stereology with electron microscopes in 502; class interdisciplinary works on photomicrography in 778.3

*For manufacture of microscopes, see 681. For microscopy in a specific subject, see the subject, plus notation 028 from Table 1, e.g., microscopy in archaeology 930.1028*

**503 Dictionaries, encyclopedias, concordances**

**[504] [Unassigned]**

Most recently used in Edition 8

**505 Serial publications**

**506 Organizations and management**

**507 Education, research, related topics**

**.2 Research**

Class research covering the sciences in the broad sense of all knowledge, scientific method as a general research technique in 001.4

*See Manual at 500 vs. 001*

**.8 Use of apparatus and equipment in study and teaching**

Class here science fair projects, science projects in schools

**508 Natural history**

Do not use for groups of people; class in 500.8

Class here description and surveys of phenomena in nature

Class natural history of organisms in 578

*See Manual at 333.7–333.9 vs. 508, 913–919, 930–990; also at 578 vs. 304.2, 508, 910*

**.09 History and biography**

Do not use for geographic treatment; class in 508.3–508.9

**.2 Seasons**

Class here interdisciplinary works on seasons

*For a specific aspect of seasons, see the aspect, e.g., effect of seasons on organisms 577.2*

**.3 Areas, regions, places in general; specific continents, countries, localities in ancient world**

- .31 Areas, regions, places in general  
Add to base number 508.31 the numbers following —1 in notation 11–19 from Table 2, e.g., natural history of the sea 508.3162
- .33 Specific continents, countries, localities in ancient world  
Add to base number 508.33 the numbers following —3 in notation 31–39 from Table 2, e.g., natural history of ancient Greece 508.338
- 4–9 Specific continents, countries, localities in modern world**  
Add to base number 508 notation 4–9 from Table 2, e.g., natural history of Brazil 508.81

## 509 History, geographic treatment, biography

Class history, geographic treatment, biography of natural phenomena in 508

## 510 Mathematics

Class here pure mathematics

*See Manual at 510*

### SUMMARY

- 510.1 Philosophy and theory  
511 General principles of mathematics  
512 Algebra  
513 Arithmetic  
514 Topology  
515 Analysis  
516 Geometry  
518 Numerical analysis  
519 Probabilities and applied mathematics

### .1 Philosophy and theory

Including metamathematics

Class mathematical logic in 511.3

## 511 General principles of mathematics

Including finite mathematics; discrete mathematics; approximations and expansions; graph theory; combinatorics (combinatorial analysis); mathematical models (mathematical simulation)

Class numerical approximation in 518; class design of experiments in 519.5; class stochastic approximation in 519.6; class interdisciplinary works on network theory in 003. Class general principles applied to a specific branch of mathematics with the branch, e.g., mathematical models of probabilities 519.2

*For a specific aspect of finite mathematics, see the aspect, e.g., finite groups 512*

**.3 Mathematical logic (Symbolic logic)**

Including logic operators, truth tables; axiom of choice, completeness theorem, decidability, formal languages, Gödel's theorem, type theory; combinatory logic, intermediate logic; nonclassical logic; sets; order, lattices, ordered algebraic structures; model theory; recursion theory; automata theory, machine theory, sequential machines, Turing machines; proof theory and constructive mathematics

Class here formal logic, propositional calculus (sentential calculus), predicate calculus; first-order logic, higher-order logic; axioms, hypotheses; interdisciplinary works on logic

Class computer mathematics in 004.01; class formal logic, propositional calculus (sentential calculus), predicate calculus, first-order logic, logic operators, truth tables from the perspective of philosophical logic in 160

*For philosophical logic, see 160; for category theory, see 512; for natural numbers, see 512.7*

**512 Algebra**

Including abstract algebra; algebra combined with other branches of mathematics; subdivisions of abstract algebra (e.g., groups and group theory, fields, rings, linear algebra); category theory, homological algebra, K-theory

Class here universal algebra, modern algebra (abstract algebra combined with number theory)

Class number theory in 512.7; class foundations of algebra, bilinear forms in 512.9; class analysis combined with linear algebra, topological vector spaces in 515; class numerical linear algebra in 518

*For arithmetic and algebra, see 513; for algebraic topology, topological K-theory, see 514; for numerical algebra, see 518*

*See Manual at 510: Combination of topics*

.001–.009 Standard subdivisions

**.7 Number theory**

Including elementary number theory; analytic number theory; algebraic number theory; geometry of numbers; probabilistic number theory; specific fields of numbers (e.g., rational numbers, algebraic numbers, real numbers, complex numbers)

Class rational functions in 512.9; class real functions, complex functions in 515; class numerical methods in 518

*For theory of equations, see 512.9*

**.9 Foundations of algebra**

Including algebraic operations; addition, subtraction, multiplication, division; theory of equations; algebra of non-equation functions; inequalities

Class algebra combined with other branches of mathematics in 512

[.900 1–.900 9] Standard subdivisions

Relocated to 512.901–512.909

.901–.909 Standard subdivisions [*formerly* 512.9001–512.9009]

## 513 Arithmetic

Including numeracy; arithmetic combined with other branches of mathematics; modular arithmetic; rapid calculations; mental arithmetic, ready reckoners, shortcuts

Class numerical methods in 518

### .2 Arithmetic operations

Including basic operations (e.g., addition, subtraction, multiplication, division); exponents and logarithms; root extraction; ratio and proportion; fractions

*For approximations, see 511*

### .5 Numeration systems

Including base 3, 5, 20 systems; binary system (base 2 system); decimal system (base 10 system)

Class decimal fractions in 513.2

## 514 Topology

Including algebraic topology; topology of spaces; metric topology; analytic topology

Class here analysis situs, homeomorphisms, homogeneous spaces, mappings

Class homological algebra, K-theory in 512; class topology combined with analysis in 515; class topology combined with geometry in 516

*For topological vector spaces, see 515; for differentiable manifolds, see 516.3.*

*For singularities in a specific subject, see the subject, e.g., singularities in functions of several complex variable 515*

## 515 Analysis

Including analysis and calculus combined with other branches of mathematics; general aspects of analysis (e.g., properties of functions, operations on functions, sequences and series, equations and functions, inequalities); differential calculus and equations; integral calculus and equations; special functions; other analytic methods (e.g., calculus of finite differences, vector, tensor, spinor analysis, calculus of variations); functional analysis; comprehensive works on real-valued, complex-valued, vector-valued functions; functions of real variables; real analysis; functions of complex variables; automorphic functions, complex analysis, conformal mapping

Class here calculus; comprehensive works on the theory of functions

Class algebraic vector analysis in 512; class number theory of continued fractions, application of Riemann zeta function with respect to prime number theory in 512.7; class differential topology in 514; class geometric vector analysis in 516; class differential geometry, integral geometry in 516.3; class numerical differentiation, numerical solutions of differential equations, of integral equations, numerical integration in 518; class probabilities, probability calculus, probability integration in 519.2; class optimization in 519.6; class comprehensive works on singularities in 514

*For algebra and calculus, topological algebras, see 512; for numerical analysis, see 518. For theory of a specific function or group of functions, see the function or group of functions, e.g., analysis of continued fractions 512.7*

## 516 Geometry

Including classical geometry; modern geometry; manifolds; convex sets; convex geometry; general aspects of geometry; automorphisms, metric geometry, transformations; affine geometry; projective geometry; abstract descriptive geometry

Class here geometry combined with topology

Class algebra combined with geometry, vector algebra in 512; class arithmetic combined with geometry in 513; class analysis combined with geometry in 515; class affine differential geometry, projective differential geometry in 516.3; class geometric probability in 519.2. Class general aspects applied to a specific geometry with the geometry, e.g., conic sections in Euclidean geometry 516.2; class geometric configurations in a specific subject with the subject, e.g., measuring the sphere in solid geometry 516.23

*For topology, topological manifolds, see 514*

.001–.009 Standard subdivisions

### .2 Euclidean geometry

Including famous problems, general aspects of Euclidean geometry (e.g., conic sections in Euclidean geometry)

Class here congruences, similarity, metric geometry

Class a specific application with the application, e.g., conic sections in plane geometry 516.22; class a specific type of Euclidean geometry with the type, e.g., Euclidean analytic geometry 516.3

.200 1–.200 9 Standard subdivisions

- .22 Plane geometry  
Including Pythagorean theorem
- .23 Solid geometry
- .24 Trigonometry  
Including plane trigonometry; spherical trigonometry; trigonometric functions  
Class analytic trigonometry in 516.3

### **.3 Analytic geometries**

Including plane analytic geometry; solid analytic geometry; analytic trigonometry; algebraic geometry; birational and conformal transformations, connections, dual geometries, intersections; bilinear and sesquilinear forms; complex multiplication; differential and integral geometry; curves, differentiable manifolds, surfaces, torsion; metric differential geometries

Class linear algebra combined with analytic geometry in 512; class analytic affine geometry, analytic projective geometry in 516; class comprehensive works in singularities in 514

*For fiber bundles, fiber spaces, see 514*

### **.9 Non-Euclidean geometries**

Including Bolyai, elliptic, Gauss, hyperbolic, inversive, Lobachevski geometries; imbeddings of non-Euclidean spaces in other geometries

Class a specific type of non-Euclidean geometry with the type, e.g., non-Euclidean analytic geometries 516.3

## **[517] [Unassigned]**

Most recently used in Edition 9

## **518 Numerical analysis**

Including algorithms; specific numerical methods (e.g., graphic methods, finite element analysis, iterative methods, probabilistic methods); numerical methods in algebra, arithmetic, number theory; numerical approximation; numerical methods in analysis; numerical methods in calculus

Class here applied numerical analysis, numerical calculations, numerical mathematics

Class approximations and expansions in 511

*For numerical statistical mathematics, see 519.5*

## **519 Probabilities and applied mathematics**

Standard subdivisions are added for probabilities and applied mathematics together; for applied mathematics alone

Class a specific application with the application, e.g., statistics in physics 530.15, game theory in gambling 795.01

**.2 Probabilities**

Including stochastic analysis; random processes (stochastic processes); probability distribution; games of chance (stochastic games); gambling; special topics of probabilities (e.g., random walks, expectation and prediction)

Class here conditional probabilities, geometric probability, probability calculus

Class probabilistic methods of numerical analysis in 518; class probabilities applied to statistical mathematics in 519.5

*For queuing processes, see 519.8*

*See Manual at 795.01 vs. 519.2*

**.3 Game theory**

Including differential games

Class games of chance in 519.2

**.5 Statistical mathematics**

Including theory of sampling; descriptive statistics, multivariate analysis, analysis of variance and covariance; statistical inference; time-series analysis; hypothesis testing; design of experiments

Class here parametric and nonparametric methods

*See Manual at 519.5, T1—01 vs. 001.4, T1—072*

**.6 Mathematical optimization**

Including stochastic optimization; combinatorial optimization

Class control theory in 515

*For a specific mathematical optimization technique, see the technique, e.g., mathematical programming 519.7*

*See also 511 for choice and decision making in combinatorial analysis*

**.7 Programming**

Including single-stage programming; multistage programming; linear programming; nonlinear programming; integer programming

.700 1–.700 9      Standard subdivisions

**.8 Special topics of applied mathematics**

Including queuing; queuing processes; inventory and storage; success runs; epidemics and fluctuations; quality control

**520 Astronomy and allied sciences**

*See Manual at 520 vs. 500.5, 523.1, 530.1, 919.9; also at 520 vs. 523.1, 523.8*



## SUMMARY

520.1–9	<b>Standard subdivisions</b>
521	<b>Celestial mechanics</b>
522	<b>Techniques, procedures, apparatus, equipment, materials</b>
523	<b>Specific celestial bodies and phenomena</b>
525	<b>Earth (Astronomical geography)</b>
526	<b>Mathematical geography</b>
527	<b>Celestial navigation</b>
528	<b>Ephemerides</b>
529	<b>Chronology</b>

### .1 **Philosophy and theory**

Do not use for chemical principles; class in 523. Do not use for physical principles; class in 523.01

### .2 **Miscellany**

[.28] Auxiliary techniques and procedures; apparatus, equipment, materials

Do not use; class in 522

## > **521–525 Astronomy**

Class comprehensive works in 520

*For geodetic astronomy, see 526*

### **521 Celestial mechanics**

Including equilibrium, problems of three and n bodies; gravitation; orbits; Kepler's laws; perturbations; precession

Class here motion

Class corrections of precession in 522; class applications to specific celestial bodies and phenomena in 523

### **522 Techniques, procedures, apparatus, equipment, materials**

Including practical astronomy (e.g., observatories, astronomical instruments, auxiliary instruments, special methods of observation); spherical astronomy; specific auxiliary techniques and procedures; corrections

Class here astrometry, positional and practical astronomy

Class positional astronomy as an aspect of mathematical geography in 526; class comprehensive works on geodetic coordinates in 526. Class spectroscopy of a specific celestial body with the body, plus notation 028 from Table 1, e.g., spectroscopy of planets 523.4028

*For practical astronomy of specific celestial bodies and phenomena, see 523*

Sextants relocated to 527.028

[.028] Auxiliary techniques and procedures; apparatus, equipment, materials

Do not use for general works, specific auxiliary techniques and procedures, class in 522

## 523 Specific celestial bodies and phenomena

Including zodiac; cosmochemistry

Class phenomena of celestial bodies directly comparable to terrestrial phenomena with the terrestrial phenomena in 550, e.g., volcanic activity on Mars 551.210999

*See Manual at 523 vs. 550*

[.001–.009] Standard subdivisions

Do not use; class in 520.1–520.9

.01 Astrophysics

Including heat; light and related radiation; electricity and magnetism; molecular, atomic, nuclear physics

*For celestial mechanics, see 521*

.1 **The universe, galaxies, quasars**

Standard subdivisions are added for the universe, galaxies, quasars together; for the universe alone

Including cosmogony; expanding universe theories; big bang theory; end of universe theories

Class here cosmology

*See also 523.8 for black holes*

*See Manual at 520 vs. 500.5, 523.1, 530.1, 919.9; also at 520 vs. 523.1, 523.8*

.2 **Planetary systems**

Including extrasolar systems; extrasolar planets

Class here solar system

*For specific parts of solar system, see 523.3–523.7*

> **523.3–523.7 Specific parts of solar system**

Class comprehensive works in 523.2

.3 **Moon**

Including constants and dimensions; optical, electromagnetic, radioactive, thermal phenomena; orbit and motions; eclipses

.4 **Planets, asteroids, trans-Neptunian objects of solar system**

Standard subdivisions are added for planets, asteroids, trans-Neptunian objects of solar system together, for planets of solar system alone

Class here comprehensive works on planets, satellites, rings of solar system

*For meteors, see 523.5; for satellites and rings, transits, occultations, see 523.9; for earth, see 525*

*See also 523.2 for extrasolar planets*

- .41 Mercury
- .42 Venus
- .43 Mars
- .44 Asteroids (Planetoids)  
 Including Ceres  
 Class comprehensive works on meteors and asteroids in 523.5
- .45 Jupiter
- .46 Saturn
- .47 Uranus
- .48 Neptune  
 Former heading: Trans-Uranian planets  
 Including constants and dimensions; optical, electromagnetic, radioactive, thermal phenomena  
 Pluto, trans-Neptunian objects relocated to 523.49
- .49 Trans-Neptunian objects [*formerly* 523.48]  
 Including Kuiper belt objects; scattered disk objects; Oort cloud objects; Pluto [*formerly* 523.48]
- .5 Meteors, solar wind, zodiacal light**  
 Including meteoroids, meteorites; meteor showers  
 Class here interplanetary matter, comprehensive works on meteors and asteroids  
*For asteroids, see 523.44*
- .6 Comets**  
 Including motion and orbits; specific comets; physical phenomena and constitution
- .7 Sun**  
 Including constants and dimensions; optical, electromagnetic, radioactive, thermal phenomena; solar energy, solar radiation; motions; photosphere; chromosphere and corona; solar interior; eclipses  
 Class sun tables indicating orbits and motions of earth in 525

**.8 Stars**

Including properties and phenomena (e.g., constants and dimensions; optical, electromagnetic, radioactive, thermal phenomena; motion); aggregations and variable stars; comprehensive works on binary stars and clusters; physical constitution; spectral types; spectroscopy, testing and measurement; kinds of stars characteristic of stages of stellar evolution; stellar evolution

Class here comprehensive works on stars and galaxies

*For galaxies, see 523.1; for sun, see 523.7*

*See also 523.1 for quasars; also 523.2 for extrasolar systems*

*See Manual at 520 vs. 523.1, 523.8: Stars and galaxies*

.802 8 Auxiliary techniques and procedures; apparatus, equipment, materials

Do not use for testing and measurement; class in 523.8

**.9 Satellites and rings; eclipses, transits, occultations**

Including transits of Mercury; transits of Venus

*For earth's moon, see 523.3. For eclipses of a specific celestial body, see the body, e.g., eclipses of the moon 523.3*

**[524] [Unassigned]**

Most recently used in Edition 6

**525 Earth (Astronomical geography)**

Including constants and dimensions; optical, radioactive, thermal properties; orbit and motions; seasons and zones of latitude; twilight; dawn

Class determination of size and shape in 526; class climatology in 551.6; class interdisciplinary works on seasons in 508.2

*For gravity, see 531; for magnetic properties, see 538*

**526 Mathematical geography**

Including geodesy; geodetic astronomy and geographic positions; geodetic aspects of positional astronomy; comprehensive works on geodetic coordinates; gravity determinations; map projections

Class here cartography, map drawing, map making

Class geodetic surveying in 526.3; class comprehensive works on positional astronomy in 522. Class map making for a specific purpose with the purpose, e.g., military map making 623

*For coordinates in spherical astronomy, see 522; for astronomical geography, see 525; for latitude in celestial navigation, longitude in celestial navigation, see 527*

*See also 912.01 for map reading*

**.3 Geodetic surveying**

Surveying in which curvature of earth is considered

Including reconnaissance surveys; bench marks; triangulation, trilateration, traversing; leveling; spirit leveling; barometric leveling; trigonometric leveling

**.9 Surveying**

Including topographic surveying; hydrographic surveying

Class here plane surveying (surveying in which curvature of earth is disregarded), land surveying

Class work of chartered surveyors (United Kingdom), interdisciplinary works on land surveys in 333; class engineering surveys in 622–629

*For geodetic surveying, see 526.3*

**527 Celestial navigation**

Including latitude; longitude; position determination

*For celestial navigation of specific craft, see the craft, e.g., navigation of nautical craft 623.89*

**528 Ephemerides**

Variant names: astronomical, nautical almanacs

Including ephemerides of specific countries and localities; ephemeris making

Class tables of specific celestial bodies in 523

.093–.099 Treatment in ancient world, treatment by specific continent

Do not use for treatment by specific country or locality; class in 528

**529 Chronology**

Including days; intervals of time; calendars; western calendars; Christian calendars; calendar reform; horology

Class time systems and standards in 389

*For sidereal month, see 523.3; for manufacture of instruments for measuring time, see 681.1*

**530 Physics**

Including instrumentation

Class here energy, matter, antimatter, classical physics; comprehensive works on classical and quantum mechanics

Class quantum mechanics, energy in quantum mechanics in 530.12; class classical mechanics, energy in classical mechanics in 531; class physical chemistry in 541

*For astrophysics, see 523.01*

## SUMMARY

- 530.01–.09**            **Standard subdivisions**  
**.1–.8**                **[Theories, mathematical physics, states of matter, measurement]**
- 531**                **Classical mechanics**  
**532**                **Fluid mechanics**  
**533**                **Pneumatics (Gas mechanics)**  
**534**                **Sound and related vibrations**  
**535**                **Light and related radiation**  
**536**                **Heat**  
**537**                **Electricity and electronics**  
**538**                **Magnetism**  
**539**                **Modern physics**
- .01                Philosophy and theory  
                           Do not use for theories; class in 530.1
- .02                Miscellany
- .028              Auxiliary techniques and procedures; materials  
                           Do not use for apparatus and equipment; class in 530. Do not use for testing and measurement; class in 530.8
- .03–.09          Standard subdivisions
- .1                Theories and mathematical physics**  
                           Standard subdivisions are added for theories and mathematical physics together, for theories alone  
                           Including space  
                           Class applications to specific states of matter in 530.4  
                           *See Manual at 520 vs. 500.5, 523.1, 530.1, 919.9*
- .11                Relativity theory  
                           Including fourth dimension  
                           Class here conservation of mass-energy, equivalence of mass-energy ( $E=mc^2$ ), space-time  
                           Class specific relativistic theories in 530.12–530.14
- .12                Quantum mechanics (Quantum theory)  
                           Including matrix mechanics (Heisenberg representation); wave mechanics; Schrödinger wave mechanics  
                           Class here relativistic, nonrelativistic quantum mechanics  
                           *For quantum statistics, quantum kinetic theories, see 530.13; for quantum field theory, see 530.14; for quantum electronics, see 537.5*  
                           *See Manual at 530.4 vs. 530.12, 531*

.13

**Statistical mechanics**

Including percolation theory; classical statistical mechanics (Boltzmann statistics); quantum statistics (quantum statistical mechanics); kinetic theories; quantum, combined quantum-classical kinetic theories; transport theory

Class here relativistic, nonrelativistic statistical mechanics

*For classical kinetic theory, see 531*

.14

**Field and wave theories**

Classical, quantum, relativistic, nonrelativistic theories accounting for fundamental particles and interactions

Standard subdivisions are added for field and wave theories together, for field theories alone

Including problem of few bodies, theory of continuum physics; electromagnetic theory; unified field theory; grand unified theory; quantum field theory; problem of many bodies

Class electromagnetic spectrum and waves in 539.2

*For wave mechanics, see 530.12; for string and superstring theories, supersymmetry, see 539.7*

.15

**Mathematical physics**

Class mathematical description of physical phenomena according to a specific theory with the theory in 530.1, e.g., statistical mechanics 530.13

**.4****States of matter**

Including solid-state physics; physics of condensed matter; liquid-state physics; fluid-state physics; gaseous-state physics; plasma physics; generalities of states of matter (e.g., phase transformations, diffusion and mass transfer)

Class here quantum mechanics of specific states of matter; sound, light, heat, electricity, magnetism as properties of a specific state of matter

Class transport theory in 530.13; class responsive behavior and energy phenomena in semiconductors, surface physics of semiconductors in 537.6

*For heat transfer, see 536; for dielectric matter, see 537; for superconductivity and superconductors, semiconductors, see 537.6; for crystallography, crystals, see 548*

*See Manual at 530.4 vs. 530.12, 531; also at 548 vs. 530.4*

**.8 Measurement**

Including dimensional analysis, testing; physical units and constants; conversion tables between systems, systems of measurement, tabulated and related materials, weights and measures

Class here interdisciplinary works on measurement, on mensuration

Class instrumentation for measurement in 530

*For social aspects of systems of measurement, see 389; for horology, see 529. For measurement, mensuration in a specific subject, see the subject, plus notation 028 from Table 1, e.g., psychological measurement 150.28; for a specific aspect of size, see the aspect, e.g., size of business enterprise 338.6*

*See also 516 for geometric mensuration*

**.801 Philosophy and theory**

Class here measurement theory

**.802 Miscellany**

Do not use for tabulated and related material; class in 530.8

**531 Classical mechanics**

Variant names: mechanics, continuum mechanics, Newtonian mechanics

Including dynamics, statics, mass and gravity, particle mechanics; specific aspects of mechanics of solids (e.g., solid statics, solid dynamics, friction and viscosity of solids, mass and gravity of solids; projectiles); mechanics of rigid bodies; energy

Class here solid mechanics

Class geodetic gravity determinations in 526; class mechanics of molecular, atomic, and subatomic particles (quantum mechanics) in 530.12; class comprehensive works on energy in physics in 530; class interdisciplinary works on energy in 333.79

*For gravity in celestial mechanics, see 521; for fluid mechanics, see 532. For a specific transformation of energy, see the resultant form, e.g., transformation of light to heat 536*

*See Manual at 530.4 vs. 530.12, 531*

**.01 Philosophy and theory**

Class classical statistical mechanics in 530.13

**532 Fluid mechanics**

Including fluid statics and dynamics; hydraulics (e.g., hydrostatics; mass, density, specific gravity of liquids; hydrodynamics)

Class here hydraulics (hydromechanics), liquid mechanics

*For pneumatics, see 533*

**.001–.009 Standard subdivisions**



**533 Pneumatics (Gas mechanics)**

Including specific aspects of pneumatics (gas mechanics) (e.g., statics; mass, density, specific gravity; dynamics; vacuums); aeromechanics; kinetic theory of gases

**> 534–538 Specific forms of energy**

Class here transformation into specific forms of energy

Class specific forms of energy as properties of specific states of matter in 530.4; class comprehensive works in 530; class comprehensive works on transformation of energy in 531

*For mechanical energy, see 531*

**534 Sound and related vibrations**

Standard subdivisions are added for sound and related vibrations together, for sound alone

Including generation of sound, transmission of sound, characteristics of sound

**.5 Vibrations related to sound**

Including subsonic vibrations; ultrasonic vibrations

Class here vibrations that can not be heard by the human ear

**535 Light and related radiation**

Standard subdivisions are added for light and related radiation together, for light alone

Including theories (e.g., corpuscular theory, mechanical wave theory, electromagnetic theory, quantum theory); physical optics; transmission, absorption, emission of light; dispersion of light

Class here optics

*For chemiluminescence, see 541; for bioluminescence, see 572. For a specific aspect of prisms, see the aspect, e.g., geometry of prisms 516*

*See also 537.5 for electron and ion optics*

**.01 Infrared and ultraviolet radiation; philosophy and theory of light and related radiation**

Notation 01 from Table 1 as modified below

Class here radiation of nonvisible spectral regions

Class theories in 535; class a specific element of infrared and ultraviolet radiation in 535; class heat radiation in 536

**.010 1–.010 9 Standard subdivisions of infrared and ultraviolet radiation****.02 Miscellany**

.028 Auxiliary techniques and procedures; apparatus, equipment, materials

Class spectroscopy in 535.8

**.5 Beams**

Including polarization

**.6 Color**

**.8 Special developments of light and related radiation**

Including optical, infrared, ultraviolet spectroscopy; comprehensive works on spectroscopy in physics

Class interdisciplinary works on spectroscopy in 543

*For a specific kind of spectroscopy in physics other than optical, infrared, or ultraviolet, see the kind, e.g., radiofrequency spectroscopy 537.5*

**536 Heat**

Including theories; heat transfer; radiation; absorption, scattering; effects of heat on matter; effects of heat that can be readily observed or measured with simple instruments; temperature; absolute temperature; specific heat; calorimetry, heat capacity; thermodynamics

Class a specific property of matter at low temperature, a specific property of matter at high temperature with the property, e.g., conduction of electricity 537.6

.01 Philosophy and theory

Do not use for theories; class in 536

**537 Electricity and electronics**

Standard subdivisions are added for electricity and electronics together, for electricity alone

Including theories; electrostatics

Class here electromagnetism

Class electromagnetic theory of matter in 530.14; class interdisciplinary works on electricity in 333.793

*For magnetism, see 538*

.01 Philosophy and theory

Do not use for theories; class in 537

**.5 Electronics**

Including exploding wire phenomena; disruptive discharges; discharge through rarefied gases and vacuums; photoelectric phenomena; electron and ion optics

Class here quantum electronics

Class comprehensive works on ionization of gases in 530.4. Class a specific application of spectroscopy with the application, e.g., X-ray spectroscopy in chemical analysis 543

*For semiconductors, see 537.6*

**.6 Electrodynamics (Electric currents) and thermoelectricity**

Standard subdivisions are added for electrodynamics and thermoelectricity together, for electrodynamics alone

Including electric conductivity and resistance

Class dielectrics in 537

*For quantum electrodynamics, see 530.14*

**538 Magnetism**

Including magnetic properties and phenomena; magnetic substances and their characteristic phenomena; magnetic induction, natural magnets; magnetohydrodynamics; geomagnetism and related phenomena

**539 Modern physics**

Including structure of matter; molecular physics

Class here quantum physics

Class nuclear structure in 539.7; class interdisciplinary works on mass spectrometry in 543

*For theories of modern physics, see 530.1; for states of matter, structure of specific states of matter, see 530.4; for modern physics of specific forms of energy, see 534–538. For spectrometry of a specific nonmolecular particle, see the particle, e.g., atomic spectrometry 539.7*

**.01 Philosophy and theory**

Do not use for theories, mathematical principles; class in 530.1

**.2 Radiation (Radiant energy)**

Class here electromagnetic radiation, spectrum, waves

*For a specific kind of radiation, see the kind, e.g., ultraviolet radiation 535.01, ionizing radiation 539.7*

**.7 Atomic and nuclear physics**

Standard subdivisions are added for either or both topics in heading

Including particle physics; ionizing radiation; antiparticles, relativistic particles; particle acceleration; nuclear structure; isotope and nuclide structure, nuclear models; nuclear activities and interactions; high-energy physics; detecting and measuring particles and radioactivity; radiation measurement

Class field theories covering fundamental interactions in 530.14; class atomic structure in 539

*For field and wave theories accounting for fundamental particles, supergravity, comprehensive works on supergravity and supersymmetry, see 530.14; for ionizations of gases, see 530.4; for magnetic properties, see 538*

**540 Chemistry and allied sciences**

Standard subdivisions are added for chemistry and allied sciences together, for chemistry alone

Class cosmochemistry in 523

**SUMMARY**

<b>540.1–.9</b>	<b>Standard subdivisions</b>
<b>541</b>	<b>Physical chemistry</b>
<b>542</b>	<b>Techniques, procedures, apparatus, equipment, materials</b>
<b>543</b>	<b>Analytical chemistry</b>
<b>546</b>	<b>Inorganic chemistry</b>
<b>547</b>	<b>Organic chemistry</b>
<b>548</b>	<b>Crystallography</b>
<b>549</b>	<b>Mineralogy</b>

**.1 Philosophy and theory**

Do not use for theoretical chemistry; class in 541

Including alchemy

**.2 Miscellany**

[.28] Auxiliary techniques and procedures; apparatus, equipment, materials

Do not use; class in 542

**.7 Education, research, related topics**

.72 Research; statistical methods

Do not use for laboratories; class in 542

**> 541–547 Chemistry**

Class comprehensive works in 540

**541 Physical chemistry**

Inorganic and combined inorganic-organic chemistry

Including special topics of physical chemistry (e.g., chemistry of states of matter); theoretical chemistry; miscellaneous topics in physical chemistry (limited to surface chemistry, solution chemistry, photochemistry, thermochemistry and thermodynamics, electrochemistry and magnetochemistry, radiochemistry, nuclear chemistry, chemical reactions, synthesis); optical activity

Class interdisciplinary works on phase transformations in 530.4; class chelates, comprehensive works on stereochemistry, on isomers, on polymerization, on polymers, on supramolecular chemistry in 547; class physical crystallography in 548

*For molecular structure studied without reference to chemical characteristics, see 539; for physical chemistry of specific kinds of inorganic chemicals, periodic law, see 546; for physical chemistry of organic compounds, see 547; for bioluminescence, see 572*

*See Manual at 541 vs. 546*

**542 Techniques, procedures, apparatus, equipment, materials**

Standard subdivisions are added for any or all topics in heading

Of inorganic and combined inorganic-organic chemistry

Including laboratories; containers and accessory equipment; specific techniques and procedures (e.g., testing and measuring; heating and distilling; filtering and dialysis; gas production, processing, measuring; auxiliary techniques and procedures, electrical and electronic equipment)

Class dialysis in chemical analysis in 543. Class techniques, procedures, apparatus, equipment, materials used in a specific application with the application, e.g., techniques and equipment for chemical analysis 543

*For analytical chemistry, see 543*

**543 Analytical chemistry**

Of inorganic or organic chemicals in general

Including general topics in analytical chemistry; specific methods (e.g., classical methods, electrochemical analysis, optical spectroscopy [spectrum analysis], nonoptical spectroscopy, chromatography)

Class here analytical chemistry of metals in general

*For spectroscopy in physics, see 535.8; for spectroscopic interpretation of chemical structure, see 541; for analytical chemistry of specific elements, compounds, mixtures, groupings (other than metals and metallic compounds in general), see 546; for analytical chemistry of specific organic compounds, see 547*

.028

Auxiliary techniques and procedures; materials

Do not use for apparatus and equipment; class in 543

**[544] [Unassigned]**

Most recently used in Edition 14

**[545] [Unassigned]**

Most recently used in Edition 14

**546 Inorganic chemistry**

Including hydrogen and its compounds; hydrogen chemistry; metals, metallic compounds, alloys; periodic law and periodic table; periodicity

Class here general topics of chemistry applied to specific elements, compounds, mixtures, groupings; comprehensive works on inorganic and organic chemistry of specific elements, compounds, mixtures, groupings

Class physical chemistry applied to inorganic chemistry as a whole, comprehensive works on atomic structure in 541; class analytical chemistry of metals in general in 543; class physical and chemical metallurgy, interdisciplinary works on metals in 669

*For organic chemistry of specific elements, compounds, mixtures, groupings, organo compounds, organometallic compounds, see 547*

*See Manual at 541 vs. 546; also at 549 vs. 546*

**547 Organic chemistry**

Including kinds of compounds identified by component elements (e.g., hydrocarbons, halocarbons, oxy and hydroxy compounds, organonitrogen compounds, organometallic compounds, organosulfur compounds, organophosphorus compounds, organosilicon compounds); physical and theoretical chemistry; organic chemical reactions; chemical reactions of compounds identified by component elements, chemical reactions of compounds identified by structure and function; addition, synthesis; kinds of compounds identified by structure and function (e.g., aliphatic compounds, cyclic compounds, aromatic compounds, macromolecules and related compounds, other organic substances [e.g., fossil substances, petroleum, high polymers, dyes and pigments])

Class here biochemicals when not considered in their biological context

Class interdisciplinary works on biochemicals, on macromolecules in 572. Class a specific compound derived from a fossil substance with the compound, e.g., synthetic rubber 678

*For inorganic polymers, see 541; for biochemistry, see 572*

.001 Philosophy and theory

Do not use for theoretical organic chemistry; class in 547

.002–.009 Standard subdivisions

**548 Crystallography**

Including chemical crystallography; crystallization; crystal growth; mathematical crystallography; physical and structural crystallography; optical crystallography

Class crystallographic mineralogy in 549; class comprehensive works on solid-state physics in 530.4. Class structural crystallography of a specific substance with the substance, e.g., structural chemistry of silicates 549

*See Manual at 548 vs. 530.4; also at 549 vs. 548*

- .01            **Philosophy and theory**  
                   Do not use for mathematical crystallography; class in 548

## 549            **Mineralogy**

Occurrence, description, classification, identification of naturally occurring minerals

Including determinative mineralogy; specific minerals (e.g., native elements; sulfides, antimonides, arsenides, selenides, tellurides; sulfosalts; halides; oxides; silicates)

Class crystallography in 548; class economic geology in 553; class comprehensive works on meteorites in 523.5; class comprehensive works on dikes in 551.8; class comprehensive works on rocks in 552; class interdisciplinary works on physico-chemical characteristics of metals in 669

*See Manual at 549 vs. 546; also at 549 vs. 548*

- .09            **History, geographic treatment, biography**  
                   Do not use for geographic treatment of minerals; class in 549.9

## .9             **Geographic treatment of minerals**

Add to base number 549.9 notation 1–9 from Table 2, e.g., minerals of Mexico 549.972

## 550            **Earth sciences**

Class here geophysics; phenomena of celestial bodies directly comparable to terrestrial phenomena, e.g., volcanic activity on Mars 551.210999

Use 550 and its standard subdivisions for works that deal comprehensively with geology, hydrology, and meteorology; for works on geology in the sense of all earth sciences. Use 551 and its standard subdivisions for works on geology in the sense limited to properties and phenomena of the solid earth

*See Manual at 523 vs. 550; also at 550 vs. 910*

### SUMMARY

<b>550.1–.9</b>	<b>Standard subdivisions</b>
<b>551</b>	<b>Geology, hydrology, meteorology</b>
<b>552</b>	<b>Petrology</b>
<b>553</b>	<b>Economic geology</b>
<b>554–559</b>	<b>Earth sciences by specific continents, countries, localities in modern world; extraterrestrial worlds</b>

- .1             **Philosophy and theory**  
                   Do not use for chemical principles; class in 551.9
- .9             **History, geographic treatment, biography**
- [.94–.99]    **Specific continents, countries, localities in modern world; extraterrestrial worlds**  
                   Do not use; class in 554–559

## 551 Geology, hydrology, meteorology

Geology: science that deals with properties and phenomena of the solid earth (lithosphere)

Use 550 and its standard subdivisions for works that deal comprehensively with geology, hydrology, and meteorology; for works on geology in the sense of all earth sciences. Use 551 and its standard subdivisions for works on geology in the sense limited to properties and phenomena of the solid earth

*For astronomical geography, see 525; for geodesy, see 526; for petrology, see 552; for economic geology, see 553; for physical geography, see 910*

*See also 363.34 for disasters; also 904 for history of events of natural origin*

### SUMMARY

- 551.01–.09 Standard subdivisions of geology**
- .1 Gross structure and properties of the earth**
  - .2 Volcanoes, earthquakes, thermal waters and gases**
  - .3 Surface and exogenous processes and their agents**
  - .4 Geomorphology and hydrosphere**
  - .5 Meteorology**
  - .6 Climatology and weather**
  - .7 Historical geology**
  - .8 Structural geology**
  - .9 Geochemistry**

.01 Philosophy and theory of geology

Do not use for chemical principles; class in 551.9

.02–.08 Standard subdivisions of geology

.09 History, geographic treatment, biography of geology

[.091 62–.091 67] Oceans and seas

Do not use; class in 551.46

[.094–.099] Geology by specific continents, countries, localities in modern world; extraterrestrial worlds

Do not use; class in 554–559

### **.1 Gross structure and properties of the earth**

Including interior of the earth; properties of interior; crust; properties of crust

Class comprehensive works on tectonics in 551.8

*For geomagnetism, see 538; for structural geology, see 551.8*

### **.2 Volcanoes, earthquakes, thermal waters and gases**

Including surface manifestations of thermal waters and gases, e.g., fumaroles, hot springs



- .21           Volcanoes
- Class here comprehensive works on craters
- Class volcanic thermal waters and gases in 551.2; class petrology of volcanic rocks in 552
- For meteorite craters, see 551.3*
- .22           Earthquakes
- Class here seismology
- Class seismic sea waves in 551.46
- .220 28           Auxiliary techniques and procedures; apparatus, equipment, materials
- Including seismography
- .3           Surface and exogenous processes and their agents**
- Standard subdivisions are added for any or all topics in heading
- Including erosion and weathering, sediments and sedimentation, soil formation, mass movement; geologic work of water; geologic work of marine waters; geologic work of wind; geologic work of frost; nivation; work of frost in erosion, in soil formation, in weathering; comprehensive works on frost; geologic work of other agents
- Class here sedimentology as study of surface processes
- Class comprehensive works on landforms in 551.41; class comprehensive works on sedimentology in 552
- For specific landforms created by water, specific landforms created by marine waters, see 551.42–551.45; for frost as a cold spell, see 551.5; for condensation of frost, see 551.57. For a specific aspect of erosion, see the aspect, e.g., erosion engineering 627, control of agricultural soil erosion 631.4*
- .300 1–.300 9           Standard subdivisions
- .31           Glaciology
- Including glaciers; glacial action; material transported by glaciers; landforms created by glaciers; glacial drift and till, moraines
- Class here geologic work of ice; interdisciplinary works on ice
- Class geologic work of frost in 551.3
- For ice in water and other forms of ice, icebergs, shelf ice, growlers, see 551.34. For a specific aspect of ice, see the aspect, e.g., ice manufacture 621.5*
- .34           Ice in water and other forms of ice
- Standard subdivisions are added for ice in water and other forms of ice together, for ice in water alone
- Including ice in the sea; sea ice (frozen seawater); anchor and frazil ice; lake and river ice; ice cover
- For snow, hail, see 551.57*

**.4 Geomorphology and hydrosphere****.41 Geomorphology**

Creation and modification of topographic landforms by erosional and depositional processes

Including arid-land geomorphology; desert geomorphology; wetland geomorphology

Class here geomorphology of continents, comprehensive works on landforms

*For landforms created by water, see 551.3; for specific landforms, see 551.42–551.45; for submarine geomorphology, see 551.46*

*See also 551.1 for continental drift*

[410 916 2–410 916 7] Treatment in oceans and seas

Do not use; class in 551.46

**> 551.42–551.45 Specific landforms**

Class here specific land formations created by water; comprehensive works on specific kinds of topographical features, on present and past examples of specific landforms

Class comprehensive works in 551.41

*For a specific landform created by plutonic action, see the landform in 551.2, e.g., volcanic mountains 551.21; for a specific landform created primarily by exogenous agents other than water or living organisms, see the landform in 551.3, e.g., glacial moraines 551.31; for a specific landform created by tectonic deformations, see the landform in 551.8, e.g., rift valleys 551.8*

**.42 Islands and reefs**

Standard subdivisions are added for islands and reefs together, for islands alone

Including barrier islands

**.43 Elevations**

Including slopes; mountains; plateaus; hills

Class orogeny in 551.8

**.44 Depressions and openings**

Including sedimentary basins; valleys; caves and related features

*For craters, see 551.21; for deltas, see 551.45; for rift valleys, see 551.8*

**.45 Plane and coastal regions**

Including pampas, plains, prairies, steppes, tundras; comprehensive works on grasslands; deltas; shorelines; changes in sea and lake levels

*For floodplains, see 551.44. For a specific kind of grassland not in a plane region, see the kind, e.g., alpine meadows 551.43*

- .46            Oceanography and submarine geology
- Standard subdivisions are added for oceanography and submarine geology together, for oceanography alone
- Including specific oceans and seas; coastal saltwater bodies; specific topics in oceanography (e.g., ocean circulation, waves, tides, physical properties of seawater, chemical oceanography); submarine geology
- Class here hydrography, hydrosphere; physical oceanography, seawater; interdisciplinary works on marine science, on oceans and seas
- Class geologic work of water in 551.3; class ice in 551.31; class comprehensive works on ocean-atmosphere interactions in 551.5; class interdisciplinary works on water in 553.7
- For sea-floor spreading, see 551.1; for hydrology, see 551.48. For a specific aspect of marine science, of oceans and seas, not provided for here, see the aspect, e.g., international law of ocean and sea waters 341.4, marine biology 578.77*
- See Manual at 578.76–578.77 vs. 551.46, 551.48*
- [.460 916 3–.460 916 7]            Treatment in specific oceans and seas
- Do not use; class in 551.46
- [.460 916 8]                        Special oceanographic forms and inland seas
- Do not use for coastal water saltwater bodies; class in 551.46. Do not use for inland seas; class in 551.48
- .48            Hydrology
- Including lakes and inland seas; freshwater lakes, freshwater ponds, freshwater lagoons; rivers and streams; waterfalls; runoff; floods
- Class here hydrological cycle, limnology, water balance
- Class comprehensive works on oceanography and hydrology in 551.46; class water resources, interdisciplinary works on water in 553.7; class interdisciplinary works on a specific inland sea or salt lake in 940–990, e.g., Caspian Sea 947.5
- For fumaroles, see 551.2; for groundwater, see 551.49; for hydrometeorology, see 551.57*
- See also 551.41 for wetland geomorphology*
- See Manual at 578.76–578.77 vs. 551.46, 551.48*
- .49            Groundwater (Subsurface water)
- Including water table; surface manifestations
- Class here aquifers
- For thermal waters, hot springs, see 551.2*

**.5 Meteorology**

Including thermodynamics, atmosphere interactions with earth's surface, temperatures, radiation; atmospheric pressure

Class here atmosphere

Class optical phenomena in 551.56; class micrometeorology, thermodynamics in microclimatology in 551.6; class forecasting and forecasts of specific phenomena in 551.64; class forecasts of specific phenomena in specific areas in 551.65; class comprehensive works on frost in 551.3

*For climatology and weather, see 551.6*

*See Manual at 551.5 vs. 551.6*

**.501 Philosophy and theory**

Do not use for forecasting and forecasts; class in 551.63

**.51 Composition, regions, dynamics of atmosphere**

Including chemistry, photochemistry of atmosphere; atmospheric regions (e.g., troposphere, upper atmosphere); mechanics; circulation; wind

Class dust storms, wind in atmospheric disturbances and formations in 551.55; class magnetic phenomena in magnetosphere, comprehensive works on magnetosphere in 538

*For atmospheric disturbances and formations, see 551.55*

Class a specific aspect of atmospheric regions with the aspect, e.g., upper-atmosphere temperatures 551.5

**.55 Atmospheric disturbances and formations**

Standard subdivisions are added for atmospheric disturbances and formations together, for atmospheric disturbances alone

Including hurricanes, tornadoes, thermal convective storms, snowstorms, ice storms, dust storms

Class here storms

Class precipitation from storms in 551.57

*See also 363.34 for storms as disasters*

**.56 Atmospheric electricity and optics**

Including electricity in stable atmosphere; optical phenomena produced by refraction, e.g., mirages, scintillation; optical phenomena produced by absorption and scattering; optical phenomena produced by condensation products; visibility

Class magnetic phenomena in 538

- .57            **Hydrometeorology**  
 Including humidity; evapotranspiration; evaporation; condensation of moisture; fog and mist; clouds; precipitation; liquid precipitation, rain, rainfall; frozen precipitation; snow surveys  
 Class geologic work of precipitation in 551.3; class snowstorms, hailstorms in 551.55; class cloud colors in 551.56; class comprehensive work on frost in 551.3; class comprehensive works on atmosphere interactions with earth's surface in 551.5; class comprehensive works on atmospheric aerosols and dust in 551.51; class interdisciplinary works on acid rain in 363.738
- .6            Climatology and weather**  
 Standard subdivisions are added for either or both topics in heading  
 Including general types of climate; microclimatology; micrometeorology  
 Class specific meteorological phenomena other than thermodynamics, comprehensive works on atmosphere interactions with earth's surface in 551.5  
*See Manual at 551.5 vs. 551.6*
- .601           **Philosophy and theory**  
 Do not use for forecasting and forecasts; class in 551.63
- .609           **History, geographic treatment, biography**  
 Do not use for geographic treatment of weather; class in 551.65. Do not use for geographic treatment of climate, of climate and weather taken together; class in 551.69
- .63            **Weather forecasting and forecasts, reporting and reports**  
 Standard subdivisions are added for weather forecasting and forecasts, reporting and reports together; for weather forecasting alone; for weather forecasts alone  
 Including historical methods of forecasting; weather lore; statistical forecasting; numerical forecasting; instrumentation in reporting and forecasting; short-range and long-range forecasts  
 Class reports of specific weather phenomena in 551.5  
*For forecasting and forecasts of specific phenomena, see 551.64*
- .630 28       **Auxiliary techniques and procedures, materials**  
 Do not use for apparatus and equipment; class in 551.63
- .630 9        **History and biography**  
 Do not use for geographic treatment; class in 551.65
- .64            **Forecasting and forecasts of specific phenomena**  
 Including specific meteorological phenomena (e.g., hurricane warnings); methods of forecasting specific phenomena for specific areas  
 Class flood forecasting and forecasts in 551.48; class forecasts of specific phenomena for specific areas in 551.65

- [.640 1–.640 9] Standard subdivisions  
Do not use; class in 551.6301–551.6309
- .65 Geographic treatment of weather  
Class here geographic treatment of weather forecasts and reports, of forecasts of specific phenomena  
Class geographic treatment of climate and weather taken together in 551.69
- [.650 1–.650 9] Standard subdivisions  
Do not use; class in 551.601–551.609
- .651–.659 Specific regions and areas  
Class here forecasts of specific phenomena for specific regions and areas  
Add to base number 551.65 notation 1–9 from Table 2, e.g., forecasts for South Africa 551.6568
- .68 Artificial modification and control of weather  
Standard subdivisions are added for either or both topics in heading
- .69 Geographic treatment of climate  
Class here paleoclimatology of specific areas, geographic treatment of climate and weather taken together  
Add to base number 551.69 notation 1–9 from Table 2, e.g., climate of Australia 551.6994  
Class general types of climate in 551.6; class microclimatology of specific areas in 551.6; class comprehensive works on paleoclimatology in 551.609  
*For geographic treatment of weather, see 551.65*
- [.690 1–.690 9] Standard subdivisions  
Do not use; class in 551.601–551.609
- .7 Historical geology**  
Including geologic time and age measurements; specific geological periods (e.g., Precambrian era, Paleozoic era, Ordovician and Silurian periods, Devonian period, Carboniferous and Permian periods, Mesozoic era, Cretaceous period, Cenozoic era; Tertiary period, Quaternary period)  
Class here paleogeography, stratigraphy  
Class history of a specific kind of geologic phenomenon with the kind, e.g., history of Jurassic volcanism in Pacific Northwest 551.2109795  
*For paleontology, see 560*  
*See Manual at 551.7 vs. 560*
- .700 1–.700 8 Standard subdivisions
- .700 9 History, geographic treatment, biography  
Do not use for geographic treatment of historical geology during a specific geological era or period; class in 551.7

[.700 94–.700 99] Historical geology of specific continents, countries, localities in modern world; extraterrestrial worlds

Do not use; class in 554–559

## **.8 Structural geology**

Including stratifications; orogeny; lateral compression of earth's crust, specific orogenies; joints and cleavages; dips, outcrops, strikes; anticlines and synclines; faults and folds; intrusions

Class here deformation, diastrophism, epeirogeny, tectonics

Class volcanoes in 551.21; class geomorphology in 551.41; class comprehensive works on elevations (e.g., mountains, plateaus, hills) in 551.43. Class a specific aspect of orogeny with the aspect, e.g., volcanism 551.21

*For plate tectonics, see 551.1*

## **.9 Geochemistry**

*For geochemistry of a specific subject in earth sciences or mineralogy, see the subject, e.g., organic geochemistry 553.2*

## **552 Petrology**

Including petrogenesis; diagenesis; properties, composition, analysis, structure of rocks; specific kinds of rocks (e.g., igneous rocks, volcanic rocks, plutonic rocks, metamorphic rocks, sedimentary rocks); microscopic petrology

Class here petrography, lithology, rocks

Class structural geology in 551.8; class comprehensive works on geochemistry in 551.9

*For mineralogy, see 549; for sedimentology as study of surface processes, see 551.3; for petrology of geologic materials of economic utility other than structural and sculptural stone, see 553*

.001–.008 Standard subdivisions

.009 History, geographic treatment, biography

Do not use for geographic distribution of rocks; class in 552.09

.09 Geographic distribution of rocks

Add to base number 552.09 notation 1–9 from Table 2, e.g., rocks of Sahara Desert 552.0966

Class rocks studied in their stratigraphic setting in 554–559

## 553 Economic geology

Quantitative occurrence and distribution of geologic materials of economic utility

Including formation and structure of deposits; inorganic gases

Class here interdisciplinary works on nonmetallic geologic materials

Class economic aspects other than reserves of geologic materials in 333.7; class formation and structure of deposits of specific materials other than inorganic gases in 553.2–553.8; class interdisciplinary works on metals in 669

*For a specific aspect of nonmetallic geologic materials other than economic geology, see the aspect, e.g., mining 622*

### .2 Carbonaceous materials

Including coal (e.g., peat, lignite [brown coal], cannel coal, bituminous and semibituminous coal, anthracite); graphite; solid and semisolid bitumens; asphalt (pitch); oil, oil shales, tar sands, natural gas; petroleum geology; fossil resins and gums

Class here fossil fuels, nonrenewable fuels, organic geochemistry; comprehensive works on fuels

Class interdisciplinary works on fuels in 662.6

*For nuclear fuels, see 553.4; for diamonds, jet, amber, see 553.8*

### .3 Iron

### .4 Metals and semimetals

Standard subdivisions are added for metals and semimetals together, for metals alone

Including gold; precious metals; copper; lead; zinc, tin, mercury; metals used in ferroalloys; antimony, arsenic, bismuth; cobalt and nickel; other metals (e.g., light metals, fissionable metals, rare-earth metals, platinum metals)

*For iron, see 553.3*

### .5 Structural and sculptural stone

Standard subdivisions are added for either or both topics in heading

Including marble and limestone; granite and syenite; sandstone; slate; serpentine, soapstone (steatite), and their variants

Class petrology of structural and sculptural stone in 552

*For semiprecious sculptural stone, see 553.8*



**.6 Other economic materials**

Including diatomaceous earth; clay; comprehensive works on ceramic materials; sand and gravel; aggregates; salts; nitrates and phosphates; mineral fertilizers; abrasives; mineral pigments and sulfur; refractory materials; cement materials

Class here earthy materials, industrial minerals

Class inorganic gases in 553; class comprehensive works on abrasives that are also gems in 553.8

*For soapstone, see 553.5; for mineral waters, see 553.7; for soils, see 631.4*

**.7 Water**

Including ice; saline water; mineral waters; surface water; groundwater (subsurface water)

Class interdisciplinary works on thermal waters in 333.8; class interdisciplinary works on ice in 551.31

*For geology of thermal waters, see 551.2*

*See Manual at 363.6*

**.8 Gems**

Including precious stones (e.g., diamonds, rubies and sapphires, emeralds); semiprecious stones

Class here comprehensive works on stones that are both gems and abrasives

*For gemstones treated as abrasives, industrial diamonds, see 553.6*

**554–559 Earth sciences by specific continents, countries, localities in modern world; extraterrestrial worlds**

Class here geology, geological surveys, stratifications

Add to base number 55 notation 4–9 from Table 2, e.g., geology of Japan 555.2, of moon 559.9

Class historical geology and stratifications of specific continents, countries, localities during a specific era or period in 551.7; class geological surveys of specific areas emphasizing materials of economic importance in 553.094–553.099; class comprehensive works on earth sciences in 550; class comprehensive works on geology in 551. Class a specific geologic topic (other than historical geology taken as a whole) in a specific area with the topic, e.g., volcanoes in Japan 551.210952, geomorphology of Japan 551.410952

**554 Earth sciences of Europe**

Number built according to instructions under 554–559

**555 Earth sciences of Asia**

Number built according to instructions under 554–559

**556 Earth sciences of Africa**

Number built according to instructions under 554–559

**557 Earth sciences of North America**

Number built according to instructions under 554–559

**558 Earth sciences of South America**

Number built according to instructions under 554–559

**559 Earth sciences of Australasia, Pacific Ocean islands, Atlantic Ocean islands, Arctic islands, Antarctica, extraterrestrial worlds**

Number built according to instructions under 554–559

**.9 Earth sciences of extraterrestrial worlds**

Number built according to instructions under 554–559

*See Manual at 523 vs. 550; also at 629.43, 629.45 vs. 559.9, 919.904*

**560 Paleontology**

Including organisms of uncertain status as plant or animal, as chordate or invertebrate; stratigraphic paleontology; special topics of paleontology and paleozoology (e.g., fossilization [taphonomy], trace fossils, paleoecology and fossils of specific environment, micropaleontology)

Class here paleozoology

Class the analysis of paleontological evidence to determine geological time and age, the analysis of paleontological evidence to determine a specific geological age, comprehensive works on paleontology and historic geology in 551.7; class fossils of specific kinds of organisms in 561–569. Class a specific kind of microfossil with the kind, e.g., fossil microorganisms 561

*See Manual at 551.7 vs. 560; also at 576.8 vs. 560*

**.9 History, geographic treatment, biography**

Class stratigraphic paleontology and paleozoology in 560

[.914–.919] Areas, regions, places in general other than polar, temperate, tropical regions

Do not use; class in 560

## 561 Paleobotany; fossil microorganisms

Standard subdivisions are added for paleontology and fossil microorganisms together, for paleontology alone

Including plantlike fossils of uncertain taxonomic position; specific plants and groups of plants (e.g., fossil dicotyledons, fossil monocotyledons, fossil gymnosperms and fernlike fossils of uncertain taxonomic position, fossil seedless plants, fossil vascular seedless plants, fossil bryophytes, fossil fungi, algae); general topics of paleobotany (e.g., stratigraphic paleobotany, fossil pollen and spores, fossil fruits and seeds, fossil leaves, trees and petrified wood, geographic treatment of fossil plants)

Class here fossil spermatophytes (seed plants), angiosperms (flowering plants); taxonomic paleobotany

Class comprehensive works on micropaleontology in 560; class comprehensive works on palynology, comprehensive works on pollen, comprehensive works on spores in 571.8

.09 History, geographic treatment, biography

Class geographic treatment of fossil plants in 561

[.091 4--091 9] Areas, regions, places in general other than polar, temperate, tropical regions

Do not use; class in 561

## > 562–569 Specific taxonomic groups of animals

Class here taxonomic paleozoology

Class comprehensive works in 560

### 562 Fossil invertebrates

Including conodonts; worms and related animals

*For Protozoa, see 561; for miscellaneous marine and seashore invertebrates, see 563; for mollusks and molluscoids, see 564; for arthropods, see 565*

### 563 Miscellaneous fossil marine and seashore invertebrates

Limited to sponges and Archaeocyatha; Parazoa; coelenterates; Anthozoa; corals; Ctenophora; comb jellies; echinoderms and hemichordates

[.01--09] Standard subdivisions

Do not use; class in 562.01–562.09

### 564 Fossil mollusks and molluscoids

Including cephalopods

### 565 Fossil arthropods

Including crustaceans and trilobites; chelicerates; arachnids; myriapods; insects; Uniramia, Hexapoda, Pterygota

**566 Fossil chordates**

Including cephalochordates, tunicates

Class here vertebrates, land vertebrates

*For fossil cold-blooded vertebrates, see 567; for fossil birds, see 568; for fossil mammals, see 569*

**567 Fossil cold-blooded vertebrates**

Including Leptolepis; amphibians

Class here fishes; bony fishes, ray-finned fishes, teleosts

**.9 Reptiles**

Including Anapsida; Euryapsida, Synapsida; Mesosauria; Lepidosauria; scaly reptiles; lizards; snakes; crocodilians

Class here archosaurs, diapsids, dinosaurs

**.91 Specific dinosaurs and other archosaurs**

Including thecodonts

Class crocodilians and “dinosaurs” of orders not considered archosaurs in 567.9

[.910 1–.910 9] Standard subdivisions

Do not use; class in 567.901–567.909

**> 567.912–567.915 Specific dinosaurs**

Class comprehensive works in 567.9

**.912 Saurischia**

Including Allosaurus, Baryonyx, Coelophysis, Deinonychus, Oviraptor, Tyrannosaurus

Class here carnivorous dinosaurs

*For herbivorous Saurischia, see 567.913*

**.913 Herbivorous Saurischia**

Including Diplodocus, Seismosaurus, Apatosaurus (Brontosaurus)

**.914 Ornithischia**

Including duck-billed dinosaurs; Anatosaurus, Corythosaurus, Hypsilophodon, Iguanodon, Maiasaura, Pachycephalosaurus, Parasaurolophus

Class here Ornithopoda

*For armored and horned dinosaurs, see 567.915*

- .915            **Armored and horned dinosaurs**  
                   Standard subdivisions are added for armored and horned dinosaurs together, for armored dinosaurs alone  
                   Including Protoceratops; Stegosaurus; Triceratops
- .918            **Flying reptiles**  
                   Including Pteranodon, pterodactyls  
                   Class comprehensive works on flying and marine reptiles in 567.9

## 568            **Fossil birds**

## 569            **Fossil mammals**

Including Metatheria and Prototheria; marsupials

### .9              **Humans and related genera**

Humans and forebears, including species and genera that are more closely related to the species *Homo sapiens* than to any other living species, e.g., *Ardipithecus*

Including Piltdown forgery; *Australopithecus*; australopithecines; *Homo erectus*

## 570            **Biology**

Class here life sciences

*For paleontology, see 560; for plants, see 580; for animals, see 590; for medical sciences, see 610*

*See Manual at 363 vs. 302–307, 333.7, 570–590, 600; also at 578 vs. 304.2, 508, 910*

### SUMMARY

- 570.1–.9        **Standard subdivisions**  
 571              **Physiology and related subjects**  
 572              **Biochemistry**  
 573              **Specific physiological systems in animals, regional histology and physiology in animals**  
 575              **Specific parts and physiological systems in plants**  
 576              **Genetics and evolution**  
 577              **Ecology**  
 578              **Natural history of organisms and related subjects**  
 579              **Natural history of microorganisms, fungi, algae**

### .1              **Philosophy and theory**

Class here nature of life, differences between living and nonliving substances

Class origin of life, conditions needed for life to begin in 576.8; class taxonomic classification in 578.01

### .2              **Miscellany**

- .28      Auxiliary techniques and procedures; apparatus, equipment, materials  
           Do not use for preservation of biological specimens; class in 570.75  
           Including microscopy  
           Class interdisciplinary works on microscopy in 502.8
- .7      Education, research, related topics**
- .72      Research  
           Including experimental biology  
           Class tissue and organ culture in 571.5; class cell culture in 571.6
- .9      History, geographic treatment, biography**  
           Do not use for geographic treatment of organisms; class in 578.09
- .919     Space  
           Do not use for space biology; class in 571.0919
- .999     Extraterrestrial worlds  
           Do not use for extraterrestrial life; class in 576.8

>      **571–575 Internal biological processes and structures**

Class here internal biological processes and structures in plants and animals

Except for modifications shown under specific entries, add to each subdivision identified by \* as follows:

- 01–08    Standard subdivisions  
           Notation from Table 1 as modified under 570.1–570.8, e.g.,  
           microscopy 028
- 09      History, geographic treatment, biography  
           Notation from Table 1 as modified under 571.09, e.g., space  
           biology 0919

Unless other instructions are given, class a subject with aspects in two or more subdivisions of 571–575 in the number coming last, e.g., cytology of animal circulatory system 573.1 (*not* 571.1 or 571.6)

Class comprehensive works in 571

*See Manual at 571–575 vs. 630; also at 571–573 vs. 610; also at 579–590 vs. 571–575*

**571      Physiology and related subjects**

Standard subdivisions are added for physiology and related subjects, for physiology alone

Class here comprehensive works on internal biological processes

*For biochemistry, see 572; for specific physiological systems in animals, regional histology and physiology in animals, see 573; for specific parts of and physiological systems in plants, see 575; for genetics, see 576.5*

- .01–.08      Standard subdivisions  
                     Notation from Table 1 as modified under 570.1–570.8, e.g., microscopy in physiology 571.028
- .09            History, geographic treatment, biography
- .091 9            Space  
                     Class here space biology
- .099 9            Extraterrestrial worlds  
                     Class extraterrestrial life in 576.8
- .1            Animals**  
                     Class here comparative physiology  
                     Class comprehensive works on animals in 590  
                     *For comparative physiology of plants and microorganisms, physiology of Protozoa, see 571.2; for physiology and related subjects in humans, see 612; for physiology and related subjects in domestic animals, see 636.089*
- .101–.108      Standard subdivisions  
                     Notation from Table 1 as modified under 590.1–590.8, e.g., microscopy in animal physiology 571.1028
- .2            Plants and microorganisms**  
                     Standard subdivisions are added for plants and microorganisms together, for plants alone  
                     Including fungi, algae  
                     Class here comparative physiology of plants and microorganisms, physiology of agricultural plants  
                     Class comprehensive works on microorganisms, fungi, algae in 579; class comprehensive works on plants in 580  
                     *See Manual at 571.6 vs. 571.2*
- .201–.208      Standard subdivisions  
                     Notation from Table 1 as modified under 580.1–580.8, e.g., microscopy in plant physiology 571.2028
- .3            \*Anatomy and morphology**  
                     Standard subdivisions are added for either or both topics in heading  
                     Class here comparative anatomy  
                     *For anatomy and morphology of microorganisms, see 571.6*

\* Add standard subdivisions as instructed under 571–575

**.4 \*Biophysics**

Including biomechanics and effects of mechanical forces; biodynamics, solid biomechanics; effects of mechanical vibrations, sound, related vibrations; radiobiology; effects of temperature; effects of electricity and magnetism; environmental biophysics

Class here effects of physical forces on organisms

Class biomechanics of locomotion in 573.7; class comprehensive works on biophysics and biochemistry in 572

*For bioenergetics, physical biochemistry, see 572*

**.5 \*Tissue biology and regional physiology**

Standard subdivisions are added for tissue biology and regional physiology together, for tissue biology alone

Including tissue anatomy, morphology, culture; specific tissues in animals (e.g., epithelial tissues, connective tissues, adipose tissues); specific tissues in plants (e.g., parenchyma); regional histology

Class here histology, histophysiology; comprehensive works on tissue and cell biology

Class biophysics of tissues in general in 571.4

*For cell biology, cell culture, see 571.6; for histogenesis, see 571.8; for regional histology and physiology of animals, see 573.9; for regional physiology of plants, regional histology of plants, see 575.4. For tissues of a specific physiological system in animals, see the system in 573, e.g., tissues of circulatory system 573.1; for tissues of a specific part or physiological system in plants, see the part or physiological system in 575, e.g., tissues of leaves 575.5*

**.6 \*Cell biology**

Including cell anatomy, morphology, biophysics, culture; membranes; biological transport; cytoplasm; endoplasmic reticulum, organelles; nucleus; nucleoplasm; cell movement; cilia, flagella, irritability, pseudopoda; cell walls

Class here cell physiology, cytology, eukaryotic cells, protoplasm

Class lipid membranes and their chemistry, protein membranes and their chemistry in 572; class nucleic acids in 572.8; class comprehensive works on tissue and cell culture in 571.5

*For reproduction and growth of cells, see 571.8; for cytopathology, see 571.9; for cytochemistry, cell digestion, metabolism, nutrition, cell respiration, ion transport, see 572; for chromosomes, see 572.8*

*See Manual at 571.6 vs. 571.2*

\* Add standard subdivisions as instructed under 571–575



**.7 \*Biological control and secretions**

Biological control: control of an organism's own physiological processes

Standard subdivisions are added for biological control and secretions together, for biological control alone

Including comprehensive works on endocrine and nervous systems; biochemistry of control; comprehensive works on hormones; homeostasis and physiological balance; body temperature; homoiothermy, poikilothermy; periodicity; biorhythms, chronobiology; dormancy; exocrine glands, comprehensive works on glands

Class excretory system of animals in 573.4; class comprehensive works on hibernation in 591.56

*For endocrine system, animal hormones, endocrine glands, see 573.4; for nervous and sensory systems, see 573.8. For secretions of a specific organ or system, or ones related to a specific process, see the organ, system or process, e.g., digestive secretions 573.3*

*See also 632 for biological control of agricultural pests*

*See Manual at 573.4 vs. 571.7*

**.8 \*Reproduction, development, growth**

Standard subdivisions are added for any or all topics in heading

Including reproduction and growth of cells; developmental genetics; embryology; development after embryo; maturation; miscellaneous topics in reproduction (limited to sex differentiation, alternation of generations [metagenesis], hermaphroditism, parthenogenesis, regeneration); vegetative reproduction; asexual reproduction

Class here physiology of life cycle, sexual reproduction

Class pathological aging and death in 571.9; class chromosome recombination in 572.8; class comprehensive works on life cycle of animals in 591.56

*For reproduction in animals, sexual reproduction in animals, see 573.6; for reproduction in plants, sexual reproduction in plants, see 575.6; for coevolution of pollination, see 576.8*

*See Manual at 571.8 vs. 573.6, 575.6*

**.9 \*Diseases**

Including pathological biochemistry; toxicology; diseases and stress caused by pollutants, by water pollution; ecotoxicology, environmental diseases, poisons; immunity; disease resistance, immune system, immunology, leukocytes, lymphocytes; miscellaneous diseases (limited to allergies, autoimmunity, immune deficiency diseases, injuries and wounds, deformities, tumors); communicable diseases; diseases caused by living organisms, by microorganisms

Class here pathology, histopathology, pathogenicity, pathophysiology; noncommunicable diseases

Class blood groups in 573.1; class comprehensive works on physiology and pathology of aging in 571.8

*For ecology of parasitism, see 577.8; for human diseases, results of experimental research on human diseases in animals, see 616; for diseases of domestic plants, comprehensive works on agricultural diseases, see 632; for diseases of domestic animals, see 636.089. For diseases of a specific physiological system in animals, see the system in 573, e.g., bone diseases 573.7; for diseases of specific parts of and physiological systems in plants, see the part or system in 575, e.g., diseases of leaves 575.5*

*See Manual at 363.73 vs. 571.9, 577.27*

**572 \*Biochemistry**

Including general topics of biochemistry (e.g., biochemical evolution, nutritional requirements); metabolism; cell digestion, structure-activity relationships, comprehensive biological works on nutrition; specific biochemicals (e.g., proteins, enzymes)

Class here cytochemistry, histochemistry; comprehensive works on biochemistry of nonmetallic elements and their compounds; comprehensive works on biochemistry and biophysics; interdisciplinary works on biochemicals, on macromolecules

Class fluid balance in 571.7; class nucleoproteins in 572.8; class chitin in 573.7; class conditions needed for life to begin in 576.8; class effects of physical agents on organisms, comprehensive works on biophysics in 571.4; class comprehensive works on molecular evolution in 572.8; class comprehensive works on respiration in animals in 573.2; class comprehensive works on animal digestion in 573.3; class interdisciplinary works on human nutrition in 363.8

*For chemistry of biochemicals, chemistry of macromolecules, see 547; for biophysics, see 571.4; for biochemistry of control processes, hormones, see 571.7; for pathological biochemistry, immunochemistry, antibodies, see 571.9; for biomineralization in animals, see 573.7; for bioluminescent organs, electric organs, see 573.9; for gas exchange from surface tissues of plants, see 575.8; for biochemistry of origin of life, see 576.8; for biogeochemistry, biogeochemical nitrogen cycle, see 577; for prions, see 579.2; for industrial biochemistry, see 660.6. For biochemistry of a specific physiological system in animals, see the system in 573, e.g., chemistry of circulatory fluids in animals 573.1; for biochemistry of a reproductive organ or physiological system in plants, see the organ or system in 575.6–575.9, e.g., chemistry of circulatory fluids in plants 575.7*

\* Add standard subdivisions as instructed under 571–575

**.8 \*Biochemical genetics**

Including metabolism; nucleic-acid hybridization, nucleic acid-protein interactions, comprehensive works on nucleoproteins; nucleotides; nucleosides; DNA (deoxyribonucleic acid); chromosomal DNA, codons, genes, genomes; chromosomes; chromatin, chromosome numbers, nucleosomes; RNA (ribonucleic acid)

Class here cytogenetics, molecular biology, molecular genetics, physiological genetics; nucleic acids

Class developmental genetics in 571.8; class genetic transfection and transformation in 571.9; class genetic aspects of a specific biochemical, amino acid sequence, genetic translation, protein synthesis in 572; class somatic variation resulting from genetic recombination, comprehensive works on genetics in 576.5; class viruses in 579.2; class recombinant DNA in 660.6

*For transduction, transfection, transformation, see 571.9; for molecular evolution during origin of life, see 576.8; for viroids, see 579.2*

*See Manual at 576.5 vs. 572.8*

**573 Specific physiological systems in animals, regional histology and physiology in animals**

Class here comprehensive works on specific physiological systems

*For specific physiological systems in plants, see 575; for specific physiological systems in humans, see 612; for specific physiological systems in domestic animals, see 636.089*

*See Manual at 571–573 vs. 610*

**[.01–.09] Standard subdivisions**

Do not use; class in 571.101–571.109

**.1 \*Circulation system**

Including circulatory fluids; blood; lymphatic system; lymph; circulatory organs (e.g., pumping mechanisms, heart, blood vessels)

Class here cardiovascular system

*For leukocytes, role of lymphatic system in immunity, lymphocytes, see 571.9. For circulation in a specific system or organ, see the system or organ, e.g., circulation in brain 573.8*

**.2 \*Respiratory system**

Including lungs; organs accessory to lungs; gills

Class here aerobic respiration, comprehensive works on respiration in animals

Class olfactory nerves in 573.8; class use of accessory respiratory organs in vocal communication in 573.9

*For cell and tissue respiration in animals, see 572; for larynx, see 573.9*

\* Add standard subdivisions as instructed under 571–575

**.3 \*Digestive system**

Including mouth and esophagus; physiology of eating, ingestion; stomach; intestine; biliary tract; liver

Class here digestion

Class insulin, comprehensive works on biology of nutrition in 572; class interdisciplinary works on human nutrition in 363.8

*For cell digestion, see 572*

**.4 \*Endocrine and excretory systems**

Standard subdivisions are added for endocrine and excretory systems together, for endocrine system alone

Including comprehensive works on animal hormones; specific endocrine glands (e.g., pituitary gland and hypothalamus, adrenal glands, thyroid and parathyroid glands); excretion, urinary system

Class here endocrinology

Class comprehensive works on animal endocrine and nervous systems in 571.7; class comprehensive works on neurohormones in 573.8

*For islands of Langerhans, see 573.3; for testes, ovaries, see 573.6; for nervous system, see 573.8. for hormones controlling a specific function in 571.5–571.9, see the function, e.g., growth hormones 571.8; for hormones of a specific endocrine gland, see the gland, e.g., estrogen 573.6; for hormones controlling a specific animal physiological system, see the function in 573, e.g., gastrointestinal hormones 573.3*

*See Manual at 573.4 vs. 571.7*

**.5 \*Integument**

Including physiology of color; hair and fur; scales, feathers, fur, hair, horns, related topics

Class here hide, skin

Class exoskeleton in 573.7; class comprehensive works on color in animals in 591.47

*For integument of a specific system or organ, see the system or organ, e.g., integument of heart 573.1*

**.6 \*Reproductive system**

Including male reproductive system; female reproductive system; pregnancy and lactation; eggs

Class here genital organs, reproduction, sexual reproduction, comprehensive works on urogenital system

Class sperm, egg cells; comprehensive works on reproduction, development, and growth of animals in 571.8; class plant ovaries in 575.6

*For embryology of animals, see 571.8; for urinary system, see 573.4*

*See Manual at 571.8 vs. 573.6, 575.6*

**.7 \*Musculoskeletal system**

Including muscles; bones; comprehensive works on skeleton; exoskeleton; joints; locomotion and related activities; crawling, running, walking, work

Class here physiology of movement

Class behavioral aspects of locomotion in 591.5; class comprehensive works on wings in 591.47

*For bone marrow, see 573.1; for horns, see 573.5. For muscles of a specific system or organ, see the system or organ, e.g., heart muscles 573.1; for biomineralization in a specific system or organ, see the system or organ, e.g., biomineralization in teeth 573.3*

**.8 \*Nervous and sensory systems**

Standard subdivisions are added for nervous and sensory systems together, for nervous system alone

Including nerves and nerve fibers; irritability, peripheral nerves; central nervous system; brain; sense organs; sensation, senses; eyes; sight, vision; ears; hearing

Class sleep behavior, migration in 591.56; class comprehensive works on regulation and control in animals, on endocrine and nervous systems in 571.7; class interdisciplinary works on sleep in 154.6

*For cell irritability, see 571.6. For innervation of a specific system or organ, see the system or organ, e.g., innervation of muscles 573.7*

**.9 Miscellaneous systems and organs in animals, regional histology and physiology in animals**

Miscellaneous systems and organs in animals limited to communication systems; vocal communication; bioluminescent organs; electric organs

Class locomotor functions of appendages in 573.7; class comprehensive works on animal communication in 591.59

*For receiving sensory systems, see 573.8*

[.901–.909] Standard subdivisions

Do not use; class in 571.101–571.109

\* Add standard subdivisions as instructed under 571–575

**[574] [Unassigned]**

Most recently used in Edition 12

**575 Specific parts of and physiological systems in plants**

*For physiological systems in fungi and algae, see 571; for specific parts of fungi and algae, see 571.5; for external description of parts and organs and their configurations, see 581.4*

[.01–.09] Standard subdivisions

Do not use; class in 571.201–571.209

**.4 \*Stems**

Including special features of stems (limited to primary epidermis; epidermis of plants; bark; phloem; nodes; thorns); wood; xylem; growing points and layers; meristem; stems specialized for reproduction; asexual reproduction, vegetative reproduction, underground stems

Class here comprehensive works on regional physiology, on shoots

Class food storage in specialized stems in 575.7; class comprehensive works on reproduction of plants in 575.6; class comprehensive works on color of plants in 581.4

*For leaves, regional physiology of roots, see 575.5; for circulation in phloem, see 575.7; for transpiration from primary epidermis, see 575.8. For color of a specific organ or part, see the organ or part, e.g., color of leaves 575.5*

**.5 Roots and leaves**

*For absorption of water and nutrients by roots, see 575.7; for transpiration from leaves, see 575.8*

**.6 \*Reproductive organs**

Including male reproductive organs; anthers, microsporangia, stamens; female reproductive organs; pistils; fruits; seeds; other flower parts; petals, sepals

Class here flowers, reproduction, sexual reproduction, sporangia

Class pollination, pollen (microspores), egg cells (megaspores), comprehensive works on reproduction, development, growth of plants in 571.8; class interdisciplinary works on flowers in 582.13

*For embryology of plants (including germination of seeds), see 571.8; for asexual reproduction, vegetative reproduction, see 575.4*

*See Manual at 571.8 vs. 573.6, 575.6*

\* Add standard subdivisions as instructed under 571–575

**.7 \*Circulation, food storage, excretion**

Standard subdivisions are added for circulation, food storage, excretion together; for circulation alone

Including circulatory fluids; sap; absorption of water and nutrients; water storage; internal isolation of unusable substances

Class transpiration in 575.8

*For a specific circulatory tissue, see the tissue, e.g., phloem, xylem 575.4*

**.8 \*Transpiration**

Class here gas exchange from surface tissues

*For a specific tissue or organ of transpiration, see the tissue or organ, e.g., leaves 575.5*

**.9 \*Animal-like physiological processes**

Including movement; sensitivity; irritability; physiology of predatory activity

Class here behavior of plants

Class comprehensive works on carnivorous plants in 583

*For movement that is a direct result of growth, see 571.8*

**> 576–578 General and external biological phenomena**

Class general and external biological phenomena of microorganisms, fungi, algae in 579; class general and external biological phenomena of plants in 580; class general and external biological phenomena of animals in 590; class comprehensive works in 578

**576 Genetics and evolution**

.01–.09 Standard subdivisions

Notation from Table 1 as modified under 570.1–570.9, e.g., microscopy in study of genetics and evolution 576.028

\* Add standard subdivisions as instructed under 571–575

**.5 Genetics**

Including laws of genetics; Mendel's laws; genetic makeup; genotypes, phenotypes; variation; factors affecting heredity and variation; population genetics; ecological genetics, gene pools, role of populations as vehicles of evolution

Class here heredity, experimental works on genetics of specific organisms; interdisciplinary works on genetics

Class toxic aspects of mutagens in 571.9; class biochemical aspects of genetic makeup, mutagenesis, radiogenetics, biochemistry of mutation (mutagenesis) in 572.8; class role of species in evolution in 576.8; class comprehensive works on population biology in 577.8

*For biochemical, molecular, physiological genetics, cytogenetics, genetic recombination as a factor affecting heredity and variation, see 572.8; for genetics of microorganisms, fungi, algae, see 579; for genetics of plants, see 581.3; for genetics of animals, see 591.3. For a specific aspect of genetics, see the aspect, e.g., eugenics 363.9, medical genetics 616, genetic engineering 660.6*

*See Manual at 576.5 vs. 572.8*

**.501–.509 Standard subdivisions**

Notation from Table 1 as modified under 570.1–570.9, e.g., microscopy in study of genetics 576.5028

**.8 Evolution**

Including homoplasmy; theories of evolution; Darwinism, natural selection; origin of life; conditions needed for life to begin, biochemistry of forms of life before achievement of full self-replication; evolutionary cycles; catastrophes, extinction, radiation; factors affecting evolution; genotype-environment interaction; speciation; role of species in evolution; coevolution; phylogeny

Class creationism in 231.7; class role of populations in evolution in 576.5; class sexual selection in 591.56; class extraterrestrial civilization, extraterrestrial intelligence in 999; class comprehensive works on molecular evolution in 572.8; class comprehensive works on symbiosis in 577.8; class comprehensive works on species in 578.01

*For role of genetics in evolution, see 576.5; for evolution of microorganisms, see 579; for evolution of plants, see 581.3; for evolution of animals, see 591.3. For evolution of a specific internal process or structure, see the process or structure, e.g., molecular evolution 572.8, evolution of circulatory system 573.1*

*See Manual at 231.7 vs. 213, 500, 576.8; also at 576.8 vs. 560*

**.801 Philosophy and theory**

Notation from Table 1 as modified under 570.1; however, do not use for theories; class in 576.8

**.802–.809 Standard subdivisions**

Notation from Table 1 as modified under 570.2–570.9, e.g., microscopy in study of evolution 576.5028



## 577 Ecology

Including ecotones; specific ecosystem processes (e.g., ecological bioenergetics; environmental chemistry; biological productivity; food chains; ecological succession)

Class here biomes, ecosystems, terrestrial ecology

Unless other instructions are given, class a subject with aspects in two or more subdivisions of 577 in the number coming last, e.g., grassland swamps 577.68 (*not* 577.4)

Class environmental chemistry of pollution in 577.27; class comprehensive works on biochemistry and biogeochemistry in 572

*For paleoecology, see 560; for ecology of microorganisms, fungi, algae, see 579; for plant ecology, see 581.7; for animal ecology, see 591.7*

*See Manual at 333.7–333.9 vs. 363.1, 363.73, 577*

### SUMMARY

<b>577.01–.09</b>	<b>Standard subdivisions</b>
<b>.2</b>	<b>Specific factors affecting ecology</b>
<b>.3</b>	<b>Forest ecology</b>
<b>.4</b>	<b>Grassland ecology</b>
<b>.5</b>	<b>Ecology of miscellaneous environments</b>
<b>.6</b>	<b>Aquatic ecology</b>
<b>.7</b>	<b>Marine ecology</b>
<b>.8</b>	<b>Synecology and population biology</b>

.01–.08 Standard subdivisions

Notation from Table 1 as modified under 578.01–578.08, e.g., microscopy in study of ecology 577.028

.09 History, geographic treatment, biography

[.091 4–.091 9] Areas, regions, places in general other than polar, temperate, tropical regions

Do not use; class in 577.3–577.7

### .2 Specific factors affecting ecology

Including biometeorology (bioclimatology); seasons; fire ecology; autecology

Class acclimatization and temperature adaptation, seasonal adaptation in 578.4

*For effect of a specific kind of microorganism, fungi, algae on the ecology, see the organism in 579.2–579.8, e.g., effect of algae on ecology 579.8; for effect of a specific kind of plant on the ecology, see the plant in 583–588, e.g., effect of grasses on ecology 584; for effect of a specific kind of animal on the ecology, see the animal in 592–599, plus notation 17 from instructions at 592–599, e.g., effect of wolves on ecology 599.77317*

[.201–.209] Standard subdivisions

Do not use; class in 577.01–577.09

.27            Effects of humans on ecology

Including fragmented landscapes; engineering works; agricultural pollution; war; pollution by acids, by specific elements and groups of elements; air pollution; pollution by combustion gases; radioactive pollution; radioecology; pollution by organic compounds; pesticide pollution

Class here effects of pollution on ecology

Class comprehensive works on ecotoxicology, on environmental toxicology in 571.9; class interdisciplinary works on pollution in 363.73

*For soil pollution, see 577.5; for water pollution, see 577.6*

*See also 304.2 for social consequences of pollution; also 577.5 for natural ecology of environments made by humans*

*See Manual at 363.73 vs. 571.9, 577.27*

>            **577.3–577.7 Ecology of specific environments**

Except for modifications shown under specific entries, add to each subdivision identified by \* as follows:

01–08    Standard subdivisions

          Notation from Table 1 as modified under 578.01–578.08, e.g.,  
          microscopy 028

09            History, geographic treatment, biography

[0914–0919]    Areas, regions, areas in general other than polar, temperate,  
                  tropical regions

          Do not use; class in base number without use of standard  
          subdivisions

Class terrestrial ecology, comprehensive works on ecology in 577; class comprehensive works on biology of specific environments in 578.7

*See Manual at 577.3–577.7 vs. 578.73–578.77; also at 577.3–577.7 vs. 579–590*

**.3            \*Forest ecology**

Including taiga ecology; ecology of boreal forests, taiga wetlands; shrubland ecology; chaparral, heath (dry moor) ecology, Mediterranean-type ecosystems

Class here ecology of exploited forests, of woodlands

Class bog ecology, comprehensive works on moor ecology in 577.68

*For forest wetland ecology, see 577.68*

.309 13            Torrid zone (Tropics)

          Class tropical rain forest ecology in 577.34

.34            **\*Rain forest ecology**

Including cloud forest ecology

Class here ecology of jungles, tropical rain forests

\* Add standard subdivisions as instructed under 577.3–577.7

- [.340 913]                      Torrid zone (Tropics)  
     Do not use; class in 577.34

**.4        \*Grassland ecology**

Including prairie ecology; meadow ecology; savanna ecology; tropical grassland ecology

Class here ecology of agricultural grasslands, of rangelands, of temperate zone grasslands

Class alpine grassland ecology in 577.5

*See also 333.74 for management of grasslands by society*

- [.409 12–.409 13]              Temperate and torrid zones  
     Do not use; class in 577.4

**.5        Ecology of miscellaneous environments**

Only those named below

Including upland ecology; coastal ecology; island ecology; mountain ecology; ecology of environments made by humans; agricultural ecology; urban ecology; suburban ecology; soil ecology; ecology of hostile land environments not provided for elsewhere (e.g., sand dune ecology; cave ecology; tundra, permafrost, glacier, snow cover ecology); extreme environments

Class island forest ecology, mountain forest ecology in 577.3; class island grassland ecology, mountain grassland ecology other than alpine grassland ecology, meadow ecology in 577.4; class ecology of atmosphere in 579

*For ecology of exploited forests, see 577.3; for ecology of agricultural grasslands, of rangelands, see 577.4. For ecology of a specific upland environment, see the environment, e.g., upland forest ecology 577.3; for ecology of a specific environment in coastal zone, see the environment, e.g., coastal forest ecology 577.3, saltwater wetland ecology 577.69, sublittoral ecology 577.7*

- [.501–.509]                      Standard subdivisions  
     Do not use; class in 577.01–577.09

**.54        \*Desert ecology**

Class here ecology in arid lands, in semiarid lands

Class sand dune ecology in 577.5

\* Add standard subdivisions as instructed under 577.3–577.7

**.6 \*Aquatic ecology**

Including river and stream ecology; floodplain ecology

Class here biological limnology, freshwater ecology

Class interdisciplinary works on limnology in 551.48. Class ecology of a specific environment on a floodplain with the specific environment, e.g., ecology of floodplain grasslands 577.4

*For marine ecology, see 577.7*

**.63 \*Lake and pond ecology**

Standard subdivisions are added for lake and pond ecology together, for lake ecology alone

Including salt lake ecology; ecology of inland seas

Class here ecology of freshwater lagoons, reservoirs

Class comprehensive works on ecology of lakes, ponds, rivers, streams in 577.6; class comprehensive works on lagoons in 577.7

**.68 \*Wetland ecology**

Including riparian ecology; forest wetland ecology; grass wetland ecology; peat bog ecology; bog, peatland, wet moor ecology; comprehensive works on moor ecology

Class here marsh, swamp ecology

*For taiga, heath (dry moor) ecology, see 577.3; for saltwater wetland ecology, see 577.69*

**.69 \*Saltwater wetland and seashore ecology**

Standard subdivisions are added for saltwater wetland and seashore ecology together, for saltwater wetland ecology alone

Including sea grass wetland ecology; forest saltwater wetland ecology; mangrove swamp ecology; tropical saltwater wetland forest ecology

Class here ecology of coastal wetlands, salt and tide marshes

*For sand dune ecology, see 577.5*

**.7 \*Marine ecology**

Including specific ecosystem processes; specific factors affecting marine ecology; ecology of specific oceans and seas; specific kinds of marine environments (e.g., surface regions; marine benthic ecology; nearshore ecology; deep sea ecology)

Class here saltwater ecology

Class comprehensive works on marine biology in 578.77

*For salt lake ecology, freshwater lagoons, see 577.63; for saltwater wetland and seashore ecology, see 577.69*

\* Add standard subdivisions as instructed under 577.3–577.7

**.8 Synecology and population biology**

Standard subdivisions are added for synecology and population biology together, for synecology alone

Including ecological communities; competition; symbiosis; population dynamics

Class here ecological aspects of sociobiology, animal-plant relationships

Class symbiosis as a factor affecting evolution in 576.8; class ecological succession, biomes in 577; class rhizosphere in 577.5; class parasites in 578.6; class behavioral aspects of sociobiology, predation in 591.5; class pathology of parasitism, comprehensive works on parasitism in 571.9; class interdisciplinary works on sociobiology in 304.5. Class plant associations characteristic of a specific environment, comprehensive works on synecology of a specific environment with the environment in 577.3–577.7, e.g., prairie grass associations, comprehensive works on synecology of grasslands 577.4; class a general relationship between a small taxonomic group and a larger taxonomic group with the smaller group, e.g., plant-microbial relationships 579 (*not* 581.7), relationships between mushrooms and dicotyledons 579.6 (*not* 583), between ferns and flowering plants 587 (*not* 581.7)

**578 Natural history of organisms and related subjects**

Standard subdivisions are added for natural history of organisms and related subjects together, for natural history of organisms alone

Class here descriptive biology, specific nontaxonomic kinds of organisms, comprehensive works on general and external biological phenomena, comprehensive works on taxonomic biology

Except for modifications shown under specific entries, add to each subdivision identified by † as follows:

01–08 Standard subdivisions

Notation from Table 1 as modified under 578.01–578.08, e.g., microscopy 028

09 History, geographic treatment, biography

*For internal biological processes of specific kinds of organisms, see 571–575; for genetics and evolution, see 576; for ecology, see 577; for natural history of microorganisms, fungi, algae, see 579; for natural history of plants, see 580; for natural history of animals, see 590*

*See Manual at 578 vs. 304.2, 508, 910*

**.01 Philosophy and theory**

Including systematics, taxonomy

Class speciation in 576.8; class comprehensive works on taxonomic biology in 578

**.02 Miscellany****.028 Auxiliary techniques and procedures; apparatus, equipment, materials**

Notation from Table 1 as modified under 570.28, e.g., microscopy in descriptive biology 578.028. Do not use for preservation of biological specimens; class in 578.075

**.07 Education, research, related topics**

- .073 Collections and exhibits of living organisms  
Class here history and description, guidebooks; bioparks
- .074 Museums, collections, exhibits  
Do not use for collections and exhibits of living organisms; class in 578.073
- .075 Museum activities and services  
Including preserving biological specimens
- .09 History, geographic treatment, biography
- [.091 4–.091 9] Areas, regions, places in general other than polar, temperate, tropical regions  
Do not use; class in 578.73–578.77
- .099 9 Extraterrestrial worlds  
Class extraterrestrial life in 576.8
- .4 †Adaptation**  
Including size, weight, shape of organisms; acclimatization and temperature adaptation; seasonal adaptation; reproductive adaptation; protective adaptation, color  
Class here organisms illustrating specific kinds of adaptation  
Class reproductive physiology in 571.8; class climate and weather as factors influencing ecology, seasonal variation as a factor influencing ecology in 577.2; class adaptation of miscellaneous nontaxonomic kinds of organisms in 578.6  
*For camouflage, see 591.47*
- .6 †Miscellaneous nontaxonomic kinds of organisms**  
Not provided for elsewhere  
Including nonnative species; alien, exotic, introduced, invasive, naturalized species; beneficial organisms; harmful organisms  
Class here economic biology  
*See Manual at 630 vs. 579–590, 641.3*
- .68 †Rare and endangered species  
Standard subdivisions are added for either or both topics in heading  
Including recently extinct species

† Add standard subdivisions as instructed under 578

**.7 Organisms characteristic of specific kinds of environments**

Class here biology of specific kinds of environments

Class specific kinds of adaptation characteristic of specific kinds of environment in 578.4; class miscellaneous nontaxonomic kinds of organisms characteristic of specific kinds of environments in 578.6

*For ecology of specific kinds of environments, see 577*

[.701–.709] Standard subdivisions

Do not use; class in 578.01–578.09

**.73–.75 Specific kinds of nonaquatic environments**

Add to base number 578.7 the numbers following 577 in 577.3–577.5 for the environment only, e.g., organisms characteristic of grasslands 578.74; then to the result add standard subdivisions as instructed under 578.01–578.09, e.g., collections of living grassland plants and animals 578.74073

Class comprehensive works on terrestrial environments in 578

*For space biology, see 571.0919; for extraterrestrial life, see 576.8*

*See Manual at 577.3–577.7 vs. 578.73–578.77*

**.76–.77 Aquatic environments**

Add to base number 578.7 the numbers following 577 in 577.6–577.7 for the environment only, e.g., marine biology 578.77; then to the result add standard subdivisions as instructed under 578.01–578.09, e.g., collections of living marine plants and animals 578.77073

*See Manual at 577.3–577.7 vs. 578.73–578.77; also at 578.76–578.77 vs. 551.46, 551.48*

**579 Natural history of microorganisms, fungi, algae**

Standard subdivisions are added for microorganisms, fungi, algae together; for microorganisms alone

Including specific topics in natural history of microorganisms, fungi, algae (e.g., genetics and evolution, adaptation, ecology, organisms characteristic of specific environments); specific nontaxonomic kinds of organisms

Class here microbiology, Protista, protophytes, Thallobionta (Thallophyta); descriptive biology of microorganisms, fungi, algae; taxonomic biology of microorganisms, fungi, algae; comprehensive works on biology of microorganisms, fungi, algae; interdisciplinary works on microorganisms, fungi, algae

Except for modifications shown under specific entries, add to each subdivision identified by \* as follows:

01–08 Standard subdivisions

Notation from Table 1 as modified under 578.01–578.08, e.g., collections of living organisms 073

09 History, geographic treatment, biography

[0914–0919] Areas, regions, places in general other than polar, temperate, tropical regions

Do not use; class in base number without use of notation from Table 1

Class food microbiology in 664.001; class experimental works on genetics of microorganisms, fungi, algae; comprehensive works on genetics in 576.5

*For internal biological processes of microorganisms, fungi, algae, see 571.2; for biochemical genetics in microorganisms, fungi, algae, see 572.8. For a specific aspect of microorganisms, fungi, algae, see the aspect, e.g., cooking mushrooms 641.6*

*See Manual at 577.3–577.7 vs. 579–590; also at 579–590; also at 579–590 vs. 571–575; also at 630 vs. 579–590, 641.3*

.01–.08 Standard subdivisions

Notation from Table 1 as modified under 578.01–578.08, e.g., collections of living microorganisms 579.073

.09 History, geographic treatment, biography

Class history, geographic treatment, biography in specific kinds of environment in 579

[.0914–.0919] Areas, regions, places in general other than polar, temperate, tropical regions

Do not use; class in 579



**.2 \*Viruses and subviral organisms**

Standard subdivisions are added for viruses and subviral organisms together, for viruses alone

Including invertebrate viruses; specific kinds of viruses (e.g., DNA viruses, RNA viruses); bacterial viruses (bacteriophages), fungal viruses; plant viruses; viroids

Class here animal viruses, vertebrate viruses, virology

Class comprehensive works in 579

*For internal biological processes of specific kinds of microorganisms, fungi, algae, see 571–575*

*See also 579.3 for rickettsias*

**.3 \*Prokaryotes (Bacteria)**

Including minor kinds of bacteria (e.g., archaeobacteria; aerobic-microaerophilic, motile, helical-vibrioid gram-negative bacteria; anaerobic gram-negative straight, curved, and helical rods; rickettsias and chlamydias; mycoplasmas); gram-negative aerobic rods and cocci; facultatively anaerobic gram-negative rods; enterobacteria; gram-positive cocci; lactic acid bacteria; endospore-forming gram-positive rods and cocci; Actinomycetes and related bacteria; anoxygenic phototrophic bacteria; purple bacteria; photosynthetic bacteria, sulfur bacteria; blue-green algae and Prochlorales

Class here bacteriology, Eubacteriales, comprehensive works on bacteria and viruses

Class bacteria culture for biological research in 571.6

*For viruses, see 579.2*

**.4 \*Protozoa**

Including zooflagellates; rhizopods; Foraminifera; Actinopoda, radiolarians; Sporozoa; Cnidospora; ciliates

Class here Sarcomastigophora

Class phytoflagellates, comprehensive works on flagellates in 579.8

*For a specific group or organism that may be regarded as either protozoa or algae, see 579.8*

**.5 \*Fungi**

Including slime molds; molds, mildew; oomycetes, imperfect fungi; ascomycetes; cup fungi; basidiomycetes

Class here true fungi, filamentous fungi, mycology

*For lichens, see 579.7; for gill fungi, comprehensive works on mushrooms, on macrofungi, see 579.6*

**.6 \*Mushrooms**

Including boletes, spine fungi, leather fungi

Class here gill fungi, macrofungi, toadstools

Class comprehensive works on basidiomycetes in 579.5

*For mushrooms, macrofungi of a specific order other than Agaricales, see 579.5*

**.7 \*Lichens****.8 \*Algae**

Including minor divisions of algae; phytoflagellates; comprehensive works on flagellates, organisms that may be regarded as either protozoa or algae; green algae); green seaweeds; euglenoids; diatoms; golden algae; dinoflagellates; brown algae; seaweeds; red algae

Class here algology, phycology

*For blue-green algae, see 579.3; for lichens, see 579.7. For a specific kind of flagellate, see the kind, e.g., zooflagellates 579.4, oomycetes 579.5*

&gt;

**580–590 Natural history of plants and animals**

Class comprehensive works on biology of plants and animals in 570; class comprehensive works on natural history of plants and animals in 578

*For internal biological processes of specific kinds of plants and animals, see 571–575; for natural history of microorganisms, fungi, algae, see 579*

## 580 Plants

Class here botany; embryophytes, vascular plants (tracheophytes), spermatophytes (seed plants), angiosperms (flowering plants); natural history of plants; descriptive biology of plants; taxonomic biology of plants; comprehensive works on biology of plants; interdisciplinary works on plants

Except for modifications shown under specific entries, add to each subdivision identified by † as follows:

01–08 Standard subdivisions

Notation from Table 1 as modified under 578.01–578.08, e.g.,  
collections of living organisms 073

09 History, geographic treatment, biography

[0914–0919] Areas, regions, places in general other than polar, temperate,  
tropical regions

Do not use; class in base number without use of notation from  
Table 1

Class interdisciplinary works on plants of agricultural importance in 630; class interdisciplinary works on food from plants in 641.3

*For paleobotany, see 561; for internal biological processes and structures of plants, see 571.2; for fungi, see 579.5; for algae, see 579.8. For a specific aspect of plants, see the aspect, e.g., plant cultivation 631.5*

*See Manual at 363 vs. 302–307, 333.7, 570–590, 600; also at 577.3–577.7 vs. 579–590; also at 579–590; also at 579–590 vs. 571–575; also at 580 vs. 582.13; also at 630 vs. 579–590, 641.3*

### SUMMARY

**580.1–.9 Standard subdivisions**

**581 Specific topics in natural history of plants**

**582 Plants noted for specific vegetative characteristics and flowers**

**583 Dicotyledons**

**584 Monocotyledons**

**585 Gymnosperms**

**586 Seedless plants**

**587 Vascular seedless plants**

**588 Bryophytes**

#### **.1–.6 Standard subdivisions**

Notation from Table 1 as modified under 578.01–578.06, e.g., microscopy of plants 580.28

#### **.7 Education, research, related topics**

**.73 Collections and exhibits of living plants**

Class here botanical gardens

**.74 Museums, collections, exhibits**

Do not use for collections and exhibits of living organisms; class in 580.73

Class here herbariums, collections of dried plants

**.75 Museum activities and services**

Including preserving botanical specimens

**.8 Groups of people****.9 History, geographic treatment, biography**

[.914–.919] Areas, regions, places in general other than polar, temperate, tropical regions

Do not use; class in 581.7

.93–.99 Botany by specific continents, countries, localities

Class plants by specific continents, countries, localities in 581.9

**581 Specific topics in natural history of plants**

Class here specific nontaxonomic kinds of plants

Except for modifications shown under specific entries, add to each subdivision identified by \* as follows:

01–08 Standard subdivisions

Notation from Table 1 as modified under 580.1–580.8, e.g.,  
preservation of botanical specimens 075

09 History, geographic treatment, biography

Unless other instructions are given, observe the following table of preference, e.g., beneficial aquatic plants 581.6 (*not* 581.7):

Miscellaneous nontaxonomic kinds of plants	581.6
Adaptation	581.4
Genetics, evolution, age characteristics	581.3
Plant ecology, plants characteristic of specific environments	581.7
Plants by specific continents, countries, localities	581.9

Class a specific topic in natural history of plants with respect to a specific taxonomic group with the group in 583–588, e.g., useful monocotyledons 584

*For plants noted for specific vegetative characteristics and flowers, see 582*

[.01–.09] Standard subdivisions

Do not use; class in 580.1–580.9

**.3 \*Genetics, evolution, age characteristics**

Standard subdivisions are added for genetics, evolution, age characteristics together, for genetics and evolution alone

Including works on genetic constitution of plants that elucidate their total function; phylogeny; age determination

Class experimental works on plant genetics, comprehensive works on genetics in 576.5

*For biochemical genetics in plants, see 572.8*

\*Add standard subdivisions as instructed under 581

**.4 \*Adaptation**

Including adaptation of specific parts of plants (e.g., reproductive adaptation, protective adaptation, color, leaves and fronds, stems and roots); size, weight, shape; acclimatization and temperature adaptation; seasonal adaptation

Class here plants noted for specific kinds of adaptation

Class color of a specific adaptation with the adaptation, e.g., color of flowers  
582.13

*For physiology of specific parts of plants, see 575; for comprehensive works on flowers and their adaptations, see 582.13*

**.6 \*Miscellaneous nontaxonomic kinds of plants**

Not provided for elsewhere

Including nonnative plants; alien, exotic, introduced, invasive, naturalized plants; beneficial plants; herbs; harmful plants

Class here economic botany

Class carnivorous plants in 583; class interdisciplinary works on weeds in 632

**.68 \*Rare and endangered plants**

Standard subdivisions are added for either or both topics in heading

Including recently extinct species

**.7 †Plant ecology, plants characteristic of specific environments**

Standard subdivisions are added for either or both topics in heading

Including specific topics in plant ecology, specific environments; synecology and population biology

Class here autecology, botany of specific environments

Class marine botany in 579; class plants characteristic of specific environments noted for specific vegetative characteristics and flowers, ecology of such plants in 582

**.9 Plants by specific continents, countries, localities**

Add to base number 581.9 notation 3–9 from Table 2, e.g., plants in Argentina  
581.982

**582 Plants noted for specific vegetative characteristics and flowers**

Class genetics and evolution, adaptation and parts other than flowers, miscellaneous kinds of plants noted for vegetative characteristics and flowers in 581

*For a specific taxonomic group of plants noted for either specific vegetative characteristics or flowers, see the group in 583–588, e.g., lilies noted for their flowers 584*

\*Add standard subdivisions as instructed under 581

†Add standard subdivisions as instructed under 580

[.01–.09] Standard subdivisions

Do not use; class in 580.1–580.9

**.1 Herbaceous and woody plants, plants noted for their flowers**

Including annuals, forbs; vines; woody vines

Class herbaceous plants noted for their flowers in 582.13

*See Manual at 635.9 vs. 582.1*

[.101–.109] Standard subdivisions

Do not use; class in 580.1–580.9

**.13 †Plants noted for their flowers**

Class here wild flowers, interdisciplinary works on flowers

Class vines noted for their flowers in 582.1; class woody plants noted for their flowers in 582.16; class comprehensive works on angiosperms (flowering plants) in 580

*For physiology of flowers, see 575.6. For a specific aspect of flowers, see the aspect, e.g., flower gardening 635.9, flower arrangement 745.92*

*See Manual at 580 vs. 582.13*

**.16 Trees**

Class here dendrology; comprehensive works on perennials, on woody plants

Class forest ecology in 577.3; class herbaceous perennials, woody vines in 582.1

*For shrubs, see 582.17*

**.17 †Shrubs**

**583 †Dicotyledons**

Including Magnoliidae (e.g., magnolias); Ranunculidae (e.g., buttercups); Hamamelididae (e.g., elms, oaks); Caryophyllidae (e.g., cacti); Dilleniidae (e.g., melons, squashes); Rosidae (e.g., grapes, ivies, legumes, maples, roses); Asteridae (e.g., thistles); laurels, carnivorous plants

Class mangrove swamp ecology in 577.69

*For mangrove of family Arecaceae (nipa palm), see 584. For hems of a specific family other than Cannabaceae, see the family, e.g., aloe and sisal hems 584*

*See Manual at 583–585 vs. 600*

†Add standard subdivisions as instructed under 580

**584 †Monocotyledons**

Including Liliidae (e.g., lilies, orchids); Arecidae (e.g., palms); Alismidae (e.g., water plantains); Commelinidae (e.g., grasses)

Class comprehensive works on grassland ecology in 577.4; class comprehensive works on hemps in 583

*See Manual at 583–585 vs. 600*

**585 †Gymnosperms**

Including specific conifers (e.g., pine family, plum-yew family, cypress family, Taxodiaceae); ginkgo (maidenhair tree); Gnetales; cycads

Class here conifers, Pinaceae

*See Manual at 583–585 vs. 600*

**586 †Seedless plants**

*For fungi, see 579.5; for algae, see 579.8; for vascular seedless plants, see 587; for bryophytes, see 588*

**587 †Vascular seedless plants**

Variant name: vascular cryptogams

Including horsetails; ferns; whisk ferns; club mosses

**588 †Bryophytes**

Including mosses, true mosses; liverworts, leafy liverworts (scale mosses)

*See also 587 for club mosses*

**[589] [Unassigned]**

Most recently used in Edition 12

**590 Animals**

Class here natural history of animals; descriptive biology of animals; taxonomic biology of animals; zoology; comprehensive works on biology of animals, interdisciplinary works on animals

Class interdisciplinary works on food from animals in 641.3

*For paleozoology, see 560; for internal biological processes and structures in animals, see 571.1. For a specific aspect of animals, see the aspect, e.g., animal husbandry 636*

*See Manual at 363 vs. 302–307, 333.7, 570–590, 600; also at 577.3–577.7 vs. 579–590; also at 579–590; also at 579–590 vs. 571–575; also at 630 vs. 579–590, 641.3; also at 800 vs. 398.24, 590, 636*

†Add standard subdivisions as instructed under 580

**SUMMARY**

<b>590.1–9</b>	<b>Standard subdivisions</b>
<b>591</b>	<b>Specific topics in natural history of animals</b>
<b>592</b>	<b>Invertebrates</b>
<b>593</b>	<b>Miscellaneous marine and seashore invertebrates</b>
<b>594</b>	<b>Mollusks and mollusoids</b>
<b>595</b>	<b>Arthropods</b>
<b>596</b>	<b>Chordates</b>
<b>597</b>	<b>Cold-blooded vertebrates</b>
<b>598</b>	<b>Birds</b>
<b>599</b>	<b>Mammals</b>

**.1–.6 Standard subdivisions**

Notation from Table 1 as modified under 578.01–578.06, e.g., microscopy of animals 590.28

**.7 Education, research, related topics**

.72 Research

.73 Collections and exhibits of living mammals

Class here general zoos; zoos limited to vertebrates in general, to land vertebrates in general, to mammals in general

Class zoos limited to other groups of animals with the group, e.g., insect zoos 595.7073

.74 Museums, collections, exhibits

Do not use for collections and exhibits of living organisms; class in 590.73

.75 Museum activities and services

Including preserving zoological specimens

**.8 Groups of people****.9 History, geographic treatment, biography**

[.914–.919] Areas, regions, places in general other than polar, temperate, tropical regions

Do not use; class in 591.73–591.77

.93–.99 Zoology by specific continents, countries, localities

Class animals by specific continents, countries, localities in 591.9



## 591 Specific topics in natural history of animals

Class here specific nontaxonomic kinds of animals

Except for modifications shown under specific entries, add to each subdivision identified by † as follows:

- 01–08 Standard subdivisions
  - Notation from Table 1 as modified under 590.1–590.8, e.g., preservation of zoological specimens 075
- 09 History, geographic treatment, biography

Unless other instructions are given, observe the following table of preference, e.g., social behavior of beneficial animals 591.56 (*not* 591.6):

Behavior	591.5
Miscellaneous nontaxonomic kinds of animals	591.6
Physical adaptation	591.4
Genetics, evolution, age characteristics	591.3
Animal ecology, animals characteristic of specific environments	591.7
Animals by specific continents, countries, localities	591.9

Class a specific topic in natural history of animals with respect to a specific taxonomic group of animals with the group of animals, plus notation 1 from table under 592–599, e.g., beneficial mammals 599.16

### SUMMARY

<b>591.3</b>	<b>Genetics, evolution, age characteristics</b>
<b>.4</b>	<b>Physical adaptation</b>
<b>.5</b>	<b>Behavior</b>
<b>.6</b>	<b>Miscellaneous nontaxonomic kinds of animals</b>
<b>.7</b>	<b>Animal ecology, animals characteristic of specific environments</b>
<b>.9</b>	<b>Animals by specific continents, countries, localities</b>

[.01–.09] Standard subdivisions

Do not use; class in 590.1–590.9

### .3 †Genetics, evolution, age characteristics

Standard subdivisions are added for genetics, evolution, age characteristics together, for genetics and evolution alone

Including works on genetic constitution of animals that elucidate their total function; phylogeny; age determination

Class sexual selection in 591.56; class experimental works on animal genetics, comprehensive works on genetics in 576.5

*For biochemical genetics in animals, see 572.8*

†Add standard subdivisions as instructed under 591

**.4 †Physical adaptation**

Including size, weight, shape; acclimatization and temperature adaptation; seasonal adaptation; head; reproductive adaptation; sex characteristics, secondary sexual characteristics

Class here animals noted for specific kinds of physical adaptation, comprehensive works on animal adaptation

Class reproductive physiology in 573.6; class fangs, horns, tusks in 591.47; class nose in 599.14

*For physiology of eggs, see 573.6; for behavioral adaptation, see 591.5*

**.47 †Protective and locomotor adaptations, color**

Standard subdivisions are added for protective and locomotor adaptations, color together; for protective adaptation alone

Including animal weapons, claws, fangs, horns, tusks; integument; camouflage and color; protective coloration; mimicry; protective covering; exoskeletons, shells, armored animals

Class here animal defenses

Class physiology of color in 573.5; class physiology of musculoskeletal system in 573.7

*For protective behavior, see 591.56*

**.5 †Behavior**

Including general topics in behavior (e.g., instinct, intelligence, learning, nocturnal behavior, sleep); feeding behavior (e.g., predation, herbivorous feeding); locomotion

Class here animal psychology, behavioral adaptation, ethology

Class comparative psychology of humans and animals in 156; class physiology of eating in 573.3; class physiology of nervous system in 573.8; class comprehensive works on animal adaptation in 591.4

*For physiology of sleep, see 573.8*

**.56 †Behavior relating to life cycle**

Including sexual behavior; courtship, mating; family behavior; maternal behavior, parental behavior; making habitations; nesting, nests; hibernation; territoriality; comprehensive works on fighting, on protective behavior; migration; migratory animals

Class here reproductive behavior, social behavior, comprehensive works on life cycle of animals

Class physiology of hibernation in 571.7; class reproductive physiology in 573.6; class physiology of navigation in 573.8; class physical reproductive adaptation in 591.4; class comprehensive works on soil animals in 591.7; class interdisciplinary works on sociobiology in 304.5

*For physiology of life cycle of animals, see 571.8; for communication, see 591.59*

†Add standard subdivisions as instructed under 591

- .59 †Communication  
 Including acoustical communication; animal sounds  
 Class stridulation in 595.7159; class vocalization in 596.159  
*For physiology of communication, see 573.9*
- .6 †**Miscellaneous nontaxonomic kinds of animals**  
 Not provided for elsewhere  
 Including nonnative animals; alien, exotic, introduced, invasive, naturalized animals; beneficial animals; harmful animals; dangerous and poisonous animals, pests  
 Class here economic zoology  
*For animals as food source, see 641.3*  
*See Manual at 630 vs. 579–590, 641.3*
- .68 †Rare and endangered animals  
 Standard subdivisions are added for either or both topics in heading  
 Including recently extinct, threatened, vanishing species
- .7 **Animal ecology, animals characteristic of specific environments**  
 Standard subdivisions are added for either or both topics in heading  
 Class here autecology, zoology of specific environments  
*For animal marking and census taking, see 590.72*
- .701–.708 Standard subdivisions  
 Notation from Table 1 as modified under 590.1–590.8, e.g., microscopy 591.7028
- .709 History, geographic treatment, biography
- [.709 14–.709 19] Areas, regions, places in general other than polar, temperate, tropical regions  
 Do not use; class in 591.73–591.77
- .72–.77 Specific factors affecting ecology, specific environments  
 Add to base number 591.7 the numbers following 577 in 577.2–577.7, e.g., effect of pollution on animals 591.727, aquatic animals 591.76
- .9 **Animals by specific continents, countries, localities**  
 Add to base number 591.9 notation 3–9 from Table 2, e.g., animals in Brazil 591.981

†Add standard subdivisions as instructed under 591

> **592–599 Specific taxonomic groups of animals**

Except for modifications shown under specific entries, add to each subdivision identified by \* as follows:

01–08 Standard subdivisions

Notation from Table 1 as modified under 590.1–590.8, e.g.,  
collections of living animals 073

09 History, geographic treatment, biography

[0914–0919] Areas, regions, places in general other than polar, temperate,  
tropical regions

Do not use; class in 173–177

1 General topics of natural history of animals

Add to base number 1 the numbers following 591 in 591.3–591.7,  
e.g., rare and endangered animals 168, marine animals 177

Do not add notation from 591.3–591.7 when redundant or nearly  
so, e.g., marine sponges 593.4 (*not* 593.4177)

Class comprehensive works in 590

**592 \*Invertebrates**

Including worms; helminthology; Platyhelminthes (flatworms); Aschelminthes  
(Nemathelminthes); Annelida (segmented worms); Oncopods (Pararthropoda)

*For Protozoa, see 579.4; for miscellaneous marine and seashore invertebrates,  
see 593; for mollusks and molluscoids, see 594; for arthropods, see 595*

**593 Miscellaneous marine and seashore invertebrates**

Limited to groups of animals provided for below

*See also 592 for marine and seashore worms; also 594 for mollusks and  
molluscoids; also 595.3 for crustaceans*

[.01–.09] Standard subdivisions

Do not use; class in 592.01–592.09

**.4 \*Sponges**

Including Calcispongiae (Calcarea); Hyalospongiae (Hexactinellida); glass  
sponges; Demospongiae

Class here Parazoa

**.5 \*Coelenterates**

Including Scyphozoa; jellyfishes, medusas; Hydrozoa; hydroids

*For Anthozoa, see 593.6*

**.6 \*Anthozoa**

Including Alcyonaria, Zoantharia (Hexacorallia); sea anemones, sea fans, sea  
pens

Class here corals

\*Add as instructed under 592–599

**.8 \*Comb jellies**

Including Nuda, Tentaculata; sea walnuts

**.9 \*Echinoderms and hemichordates**

Including Crinozoa; starfish; Ophiuroidea; Echinozoa; sea cucumbers

Subdivisions are added for echinoderms and hemichordates together, for echinodermata alone

*See also 592 for Echinodera*

**594 \*Mollusks and molluscoids**

Including gastropods, snails, slugs, bivalves, clams, cephalopods

Class here malacology, comprehensive works on shellfish

Subdivisions are added for mollusks and molluscoids together, for mollusks alone

*For crustacean shellfish, see 595.3*

**595 \*Arthropods**

Class Pararthropoda in 592

**.3 \*Crustaceans**

Including branchiopods; ostracods (mussel shrimps, seed shrimps); copepods; barnacles; fish lice, horseshoe shrimps, mustache shrimps; Malacostraca; Peracarida; Eucarida; decapods, Reptantia

**.4 \*Chelicerates**

Including horseshoe crabs and sea spiders

Class here arachnids

**.6 \*Myriapods**

Including centipedes; symphylans; pauropods; millipedes

**.7 \*Insects**

Including Apterygota; Orthoptera and related orders; Exopterygota (Hemimetabola); scorpion flies, caddisflies, lacewings, dobsonflies and alderflies, snakeflies; Homoptera; true bugs; sucking lice (true lice); bird lice (biting lice, chewing lice); thrips

Class here Uniramia, Hexapoda, Pterygota, Endopterygota (Holometabola); entomology

*For myriapods, see 595.6*

**.76 \*Beetles**

Including Strepsiptera; Adephaga, Archostemata, Myxophaga

Class here Polyphaga

- .77      **\*Flies (Diptera) and fleas**  
             Subdivisions are added for flies and fleas together, for flies alone  
             Class maggots in 595.7713
- .78      **\*Moths and butterflies**  
             Including Bombycoidea, Geometroidea, Noctuoidea, Pyralidoidea,  
             Tineoidea, Tortricoidea; Hesperioidea (skippers)  
             Including armyworms, budworms, cutworms, Heliothis  
             Subdivisions are added for moths and butterflies together, for moths alone  
             Class caterpillars in 595.7813
- .79      **\*Hymenoptera**  
             Including Chalcidoidea, Ichneumonoidea, Scolioidea, sawflies; ants;  
             Vespoidea and Sphecoidea; true wasps; bees  
             Class here Apocrita, wasps, social insects

## 596      **\*Chordates**

Including tunicates, lancelets

Class here vertebrates, land vertebrates, amniotes

*For cold-blooded vertebrates, see 597; for birds, see 598; for mammals, see 599*

[.073]      Collections and exhibits of living vertebrates

Do not use; class in 590.73

## 597      **\*Cold-blooded vertebrates**

Including jawless fishes, hagfishes and lampreys

Class here fishes, bony fishes, ray-finned fishes, teleosts; ichthyology

Class koi, interdisciplinary works on goldfish in 639.3; class interdisciplinary works on carp in 641.3

.073      Collections and exhibits of living fishes

Class here interdisciplinary works on aquariums

*For fish culture in aquariums, see 639.34*

.176 3      Lake and pond ecology

Number built according to instructions under 592–599

Class fishpond ecosystems in 577.63

**.3 \*Selachii, Holocephali, fleshy-finned fishes**

Including chimeras (ghost sharks)

Class here cartilaginous fishes, Elasmobranchii, Lamniformes covering most sharks, Carcharhiniformes; sharks

Subdivisions are added for Selachii, Holocephali, fleshy-finned fishes together; for Selachii alone

Class cartilaginous ganoids in 597

**.5 \*Protacanthopterygii**

Including Gonorhynchiformes, Stomiiformes (Stomiatiformes); marine hatchetfishes; milkfish, mudminnows, smelts, stomiatoid dragonfishes, viperfishes

Class here Salmoniformes

Class Myctophiformes in 597

*See also 597 for freshwater hatchetfishes, dragonfishes of order Pegasiformes, Australian salmon*

**.8 \*Amphibians**

Including Gymnophiona; Urodela

Class here frogs and toads

Class herpetology, comprehensive works on amphibians and reptiles in 597.9

**.9 \*Reptiles**

Including Lepidosauria; scaly reptiles

Class here herpetology, comprehensive works on amphibians and reptiles

*For amphibians, see 597.8*

**.92 \*Turtles**

Including snapping turtles; Kinosternidae; mud turtles; tortoises; Emydidae; terrapins; soft-shelled turtles, New Guinea plateless turtle, Dermatemydidae, Platysternidae; sea turtles; Cheloniidae, marine turtles; side-necked turtles

Class here Testudinoidea

[.921 77] Marine turtles

Do not use; class in 597.92

**.95 \*Lizards**

Including Gekkonidea; geckos; Iguanidae; Iguanioidea; Agamidae; chameleons; Rhiptoglossidea; skinks; Scincomorphoidea; New World runners, girdle-tailed lizards, Old World runners; Anguinomorphoidea

Class comprehensive works on lizards and snakes in 597.9

.96        \*Snakes  
              Including vipers; adders; Elapidae; sea snakes; marine snakes; Booidea  
              (Henophidia); boas; Typhlopoidea (Scolophorida)

Class here Colubroidea

[.961 77]                Marine snakes

Do not use; class in 597.96

.98        \*Crocodilians  
              Including gavia; crocodiles; Alligatoridae; alligators, Alligator  
              mississippiensis

## 598        \*Birds

Class here land birds, ornithology

Class specific kinds of land birds in 598.5–598.9; class comprehensive works  
 on warm-blooded vertebrates in 599; class interdisciplinary works on species of  
 domestic birds in 636.5

.16        Miscellaneous nontaxonomic kinds of birds

Number built according to instructions under 592–599

Including game birds, wildfowl

Class lowland game birds, waterfowl in 598.4; class upland game birds in  
 598.6

.176       Aquatic birds

Number built according to instructions under 592–599

Class here water birds

Class waterfowl in 598.4

*For specific kinds of water birds, see 598.3–598.4*

---

### >        **598.3–598.4 Water birds**

Class comprehensive works in 598.176

.3        \*Gruiformes, Charadriiformes, Ciconiiformes, flamingos

Including Charadrii, shore birds

Class here wading birds



**.4 Miscellaneous orders of water birds**

Limited to those named below

Including Anseriformes; waterfowl; ducks; comprehensive works on lowland game birds; Procellariiformes; Pelecaniformes; loons and grebes; Colymbiformes

Class comprehensive works on water birds in 598.176

*For a specific kind of lowland game bird not provided for here, see the kind, e.g., murre 598.3*

[.401–.409] Standard subdivisions

Do not use; class in 598.17601–598.17609

.47 \*Penguins

**> 598.5–598.9 Land birds**

Class comprehensive works in 598

**.5 \*Palaeognathae**

Including rheas and ostriches; Casuariiformes; cassowaries; kiwis; tinamous

Class here ratites

**.6 \*Galliformes and Columbiformes**

Class here poultry, upland game birds

Subdivisions are added for Galliformes and Columbiformes together, for Galliformes alone

Class results of experimental studies in internal biological processes using chickens in 571–573, e.g., embryology in domestic chickens 571.8; class interdisciplinary works on domestic poultry, interdisciplinary works on chickens, interdisciplinary works on turkeys in 636.5

*For a specific kind of upland game bird, see the kind, e.g., crows 598.8*

**.7 Miscellaneous orders of land birds**

Limited to Psittaciformes; parrots; Piciformes; Pici; Trogoniformes (trogons); Trogonidae; Cuculiformes; Coliiformes; mousebirds; Apodiformes; Coraciiformes

Class comprehensive works on land birds in 598

[.701–.709] Standard subdivisions

Do not use; class in 598.01–598.09

\*Add as instructed under 592–599

**.8 \*Perching birds (Passeriformes)**

Including bell magpies, cuckoo shrikes, honey eaters, magpie larks, vanga shrikes, wattled crows, wood shrikes, wood swallows; Nonoscine Passeriformes, titmice, larks, martins and swallows, Certhiidae, Sittidae; dippers, water ouzels, wrens, babblers, wren-tit; thrushes, Old World warblers, Mimidae, Old World flycatchers; waxwings, silky flycatchers, pipits and wagtails; shrikes, starlings, Corvidae, birds of paradise; New World warblers, Icteridae, tanagers, swallow-tanager, vireos, pepper-shrikes, shrike-vireos; finches and related birds

Class here songbirds

**.9 \*Falconiformes, Caprimulgiformes, owls**

Including secretary bird

Class here birds of prey, raptors

Subdivisions are added for Falconiformes, Caprimulgiformes, owls together; for Falconiformes alone

**599 \*Mammals**

Class here warm-blooded vertebrates, placental mammals

Class interdisciplinary works on species of domestic mammals in 636

*For birds, see 598*

**SUMMARY**

<b>599.16</b>	<b>[Miscellaneous nontaxonomic kinds of mammals]</b>
<b>.2</b>	<b>Marsupials and monotremes</b>
<b>.3</b>	<b>Miscellaneous orders of placental mammals</b>
<b>.4</b>	<b>Bats</b>
<b>.5</b>	<b>Cetaceans and sea cows</b>
<b>.6</b>	<b>Ungulates</b>
<b>.7</b>	<b>Carnivores</b>
<b>.8</b>	<b>Primates</b>
<b>.9</b>	<b>Humans</b>

[.073] Collections of living mammals

Do not use; class in 590.73

.16 Miscellaneous nontaxonomic kinds of mammals

Number built according to instructions under 592–599

Class big game animals in 599.6; class fur-bearing animals in 599.7

[.177] Marine mammals

Do not use; class in 599.5

**.2 \*Marsupials and monotremes**

Class here Diprotodontia

Subdivisions are added for marsupials and monotremes together, for marsupials alone

**.3 Miscellaneous orders of placental mammals**

Limited to those named below

Including Edentata (Xenarthra), pangolins (scaly anteaters), armadillo (ant bear)

Class comprehensive works in 599

*For spiny anteaters, see 599.2*

[.301–.309] **Standard subdivisions**

Do not use; class in 599.01–599.09

**.32 \*Lagomorphs**

Including Leporidae (e.g., Old World rabbit, cottontails, Lepus, hares, jackrabbits); pikas, conies

Class here rabbits

Class interdisciplinary works on domestic rabbits in 636.932

**.33 \*Insectivora and related orders**

Including colugos (flying lemurs); otter shrews, solenodons, tenrecs; elephant shrews; tree shrews

Subdivisions are added for Insectivora and related orders together, for Insectivora alone

**.35 \*Rodents**

Including jerboas; harvest and jumping mice; mole and swamp rats; specific kinds of Muridae (e.g., common rats, black rat, Norway [brown] rat, common mice, house mouse, voles, meadow mice, deer mice [white-footed mice], hamsters, Cricetus, golden hamsters, cotton rats, wood rats, muskrats, lemmings, gerbils, field mice, wood mice); rodents other than beavers, Muridae, squirrel family (e.g., Caviomorpha, Hystricomorpha, Phiomorpha, Caviidae, Cavia, cavies, guinea pigs, chinchillas, dormice, porcupines, Heteromyidae, pocket gophers)

Class here Myomorpha; Muridae covering Cricetidae, Rhizomyidae, Spalacidae; mice; rats

Class results of experimental studies on internal biological processes using laboratory mice and rats in 571–573, e.g., circulation in rats 573.1; class interdisciplinary works on domestic species of hamsters, interdisciplinary works on domestic species of gerbils, interdisciplinary works on domestic guinea pigs, interdisciplinary works on chinchillas in 636.935

*For squirrel family, see 599.36; for beavers, see 599.37*

\*Add as instructed under 592–599

- .36      **\*Squirrel family**  
           Including tree squirrels, Eurasian red squirrel, fox squirrel, gray squirrel; Tamiasciurus; Douglas squirrel; chipmunks; ground squirrels; Spermophilus; marmots, woodchuck (groundhog); prairie dogs; flying squirrels; Glaucomys; eastern flying squirrel  
           Class here squirrels  
           *See also 599.35 for pocket gophers*
- .37      **\*Beavers**  
           Subdivisions are added for the genus as a whole and for individual species
- .4      \*Bats**  
           Including Phyllostomidae; Vespertilionidae; Old World fruit bats; Megachiroptera  
           Class here Microchiroptera
- .5      \*Cetaceans and sea cows**  
           Class here marine mammals; whales, great whales; baleen whales, toothed whales  
           Class false killer whales, pilot whales, killer whale in 599.53  
           Subdivisions are added for cetaceans and sea cows together, for cetaceans alone  
           *For marine carnivores, see 599.79*
- .53      **\*Dolphins and porpoises**  
           Including false killer whales, killer whale, pilot whales; river dolphins; harbor porpoises  
           Class here Delphinidae  
           Subdivisions are added for dolphins and porpoises together, for dolphins alone
- .55      **\*Sea cows**  
           Including Dugongidae, dugong  
           Class here manatees  
           Subdivisions are added for individual species of manatees
- .6      \*Ungulates**  
           Including hyraxes  
           Class here hoofed mammals, comprehensive works on big game animals  
           Class sea cows in 599.55; class big game hunting in 799.2  
           *For a specific kind of nonungulate big game animal, see the kind, e.g., bears 599.78*

- .63      \*Even-toed ungulates  
           Including mouse deer; pigs (swine); comprehensive works on Suiformes; peccaries; hippopotamuses; Hippopotamus amphibius; Camelidae; pronghorn  
           Class here ruminants  
           Class comprehensive works on even-toed and odd-toed ungulates in 599.6; class interdisciplinary works on camels in 636.2; class interdisciplinary works on domestic swine in 636.4  
           *For bovids, see 599.64; for deer, see 599.65*
- .638     \*Giraffe and okapi  
           Subdivisions are added for giraffe and okapi together, for giraffe alone
- .64      \*Bovids  
           Including duikers; Bovinae; bison; American bison (American buffalo); Hippotraginae; Alcelaphinae; Antilopinae; Caprinae; Capra; goats  
           Class here antelopes  
           Class sheep in 599.649; class interdisciplinary works on domestic cattle in 636.2; class interdisciplinary works on domestic goat in 636.3  
           *See also 599.63 for pronghorn antelope*
- .649     \*Sheep  
           Including aoudad (Barbary sheep), bharals (blue sheep); bighorn sheep  
           Class here Ovis  
           Class interdisciplinary works on domestic sheep in 636.3
- .65      \*Deer  
           Including chital, muntjacs; Odocoileus; white-tailed (Virginia) deer; mule deer; Cervus; fallow deer; elk (moose); caribou (reindeer); roe deer  
           *See also 599.63 for mouse deer*
- .66      \*Odd-toed ungulates  
           Including tapirs, rhinoceroses
- .665     \*Horse family  
           Including asses; horse, mustang, Przewalski's horse, wild horse; zebras  
           Class here Equus  
           Class interdisciplinary works on asses, interdisciplinary works on horses in 636.1
- .67      \*Elephants  
           Including African elephant, Asiatic elephant (Indian elephant)

**.7 \*Carnivores**

Class here land carnivores, comprehensive works on fur-bearing animals

*For a specific kind of noncarnivorous fur-bearing animal, see the kind, e.g., beavers 599.37*

---

> 599.74–599.78 Land carnivores

Class comprehensive works in 599.7

**.74 \*Feloidea**

Including Viverridae; Hyaenidae; hyenas

*For cat family, see 599.75*

**.75 \*Cat family**

Including clouded leopard; Felis; lynx; Panthera (Leo); big cats; cheetah

Class interdisciplinary works on domestic cats in 636.8

**.756 \*Tiger****.757 \*Lion****.76 \*Canoidea**

Including Procyonidae; Mustelidae; Mustelinae; Melinae and Mellivorinae; badgers; skunks (polecats)

Class interdisciplinary works on ferrets (domestic European polecat) in 636.976

*For dog family, see 599.77; for bears, see 599.78*

*See also 599.789 for giant panda*

**.769 \*Otters**

Including clawless and giant otters; river otters; sea otter

**.77 \*Dog family**

Including dhole; dogs and wolves of genera other than Canis; Canis, comprehensive scientific works on dogs

Class interdisciplinary works on dogs in 636.7

**.773 \*Gray wolf and red wolf**

Variant name for gray wolf: timber wolf

Class here comprehensive works on wolves

Subdivisions are added for either or both topics in heading

Class wolves of genera other than Canis in 599.77

- .775      \*Foxes  
             Class here red fox, foxes of genus *Vulpes*  
             Subdivisions are added for the genus as a whole and for individual species  
             *For foxes of genera other than Vulpes, see 599.776*
- .776      \*Foxes of genera other than *Vulpes*  
             Including fennec and gray foxes, Arctic fox
- .78        \*Bears  
             Including American black bear  
             Class here *Ursus*
- .784      \*Grizzly bear (Brown bear)
- .786      \*Polar bear
- .789      \*Giant panda  
             *See also 599.76 for lesser panda*
- .79        \*Marine carnivores  
             Including eared seals, walrus  
             Class here earless seals (hair seals, true seals); seals  
             *See also 599.769 for sea otters*
- .8        \*Primates**  
             Including Prosimii  
             Class here Anthroidea, monkeys  
             Class tree shrews in 599.33  
             *For humans, see 599.9*
- .88        \*Great apes and gibbons  
             Including Hylobates; orangutan  
             Class here apes, comprehensive works on hominoids  
             Subdivisions are added for great apes and gibbons together, for great apes alone  
             *For humans, see 599.9*
- .884      \*Gorillas
- .885      \*Chimpanzees  
             Subdivisions are added for the genus as a whole and for individual species

**.9 Humans**

Including anthropometry; variation; environmental effects on physique; human biological ecology

Class here physical anthropology

Class social anthropology, interdisciplinary works on social and physical anthropology in 306; class use of fingerprints in criminal investigation in 363.25; class pathological aspects of abnormal dimensions in 616; class interdisciplinary works on human ecology in 304.2

*For psychology, see 150; for prehistoric Homo and related genera, see 569.9; for medicine, see 610*

*See Manual at 599.9 vs. 611*

**.93 Genetics, sex and age characteristics, evolution**

Including heredity; secondary sexual characteristics; age determination

Class variation in 599.9; class longevity in 612.6

*For paleontology of Homo and related genera, see 569.9; for biochemical genetics, see 611*

**.97 Human ethnic groups**

Including origins and causes of physical differences among ethnic groups

Class here physical ethnology

Class nonethnic physical characteristics in 599.9; class origins and causes of physical differences of specific ethnic groups in 599.98

*For specific ethnic groups, see 599.98*

**.98 Specific ethnic groups**

Class extinct ethnic groups in 569.9