Who are the following **Famous Scientists/Oceanographers?**

900	**Homer**	Mediterranean as a continuous river
600	**Pythagoras**	Greek philosopher who thought the **world was spherical**
300s	**Aristotle**	wrote about the formation of frogs from damp earth & of mice from decaying grain
325	**Pytheas**	Links **tides** to the movement of the **moon**
200s	**Archimedes**	**Archimedes' Principle**: the force of a submerged object is equal to the Buoyant Force minus the weight of the object (buoyant force=weight of the displaced fluid)
230	**Eratosthenes**	Greek Scholar & librarian in Alexandria who was the first to calculate the **circumference** of the Earth, & invents **Longitude** & **Latitude**
127	**Hipparchus**	Arranges **Longitude** & **Latitude** in a **rectangular grid** by **degrees**
151	Claudius **Ptolemy**	Creates the first known **Atlas**, & tries to estimate Earth's circumference
1450s	Prince **Henry**	"**Henry the Navigator**," Prince of Portugal who established a school for the study of geography, seamanship, shipbuilding, & navigating
1478 - 1553	Girolamo **Francastoro**	wrote about the **contagions** involved in the disease process
1492	Christopher **Columbus**	Italian explorer who discovered the **Caribbean Islands** (in Spanish Ships) Note: Columbus did NOT discover North America, in fact he never even saw it
1522	Ferdinand **Magellan**	Portuguese navigator in the service of Spain, the 1st to **circumnavigate** the Earth
1543	Nicolaus **Copernicus**	**Heliocentric** (sun-centered) universe
1564 - 1642	Galileo **Galolei**	"**Father of Modern Science**" supported ***Copernicus'*** **heliocentric** view, & laid the foundation for **inductive reasoning**
1569	Gerardus **Mercator**	**cylindrical map projection**
1577 - 1580	Sir Francis **Drake**	lead the first **circum navigation** of the earth
1607 - 1611	Henry **Hudson**	explores **North America**
1608	Hans **Lippershey**	invented the **telescope**
1609	Hugo **Grotius**	Wrote *Mare Liberum*, the foundation of all **modern law of the sea**
1635 - 1703	Robert **Hooke**	examined the structure of corn & inferred that all living creatures were made up of **individual cells**
1683	Antony van **Leeuwenhoek**	developed a **solar microscope** that led to the 1st recorded observations of **bacteria**
1687	Isaac **Newton**	Explains how **gravity** works
1688	Francesco **Redi**	an Italian physician who attacked the doctrine of spontaneous generation, by proving that maggots couldn't develop without the presence of oxygen

Who are the following **Famous Scientists/Oceanographers?**

1700s	James **Hutton**	developed the modern concept of **geologic time**
1700s	Joseph **Priestly**	discovered **photosynthesis**
mid-1700s	Lazzaro **Spallanzani**	found that most organisms were destroyed by boiling water for just a few min
1731	George **Hadley**	British lawyer & philospher who worked out the overall scheme of **wind circulation** in an effort to explain the **trade winds**; Hadley's octant?
1735	Leonhard **Euler**	swiss mathematician known for his contributions to **infintesimal calculus** & **graph theory**; he introduced the use of **exponential functions** & **logarithms** in analytic proofs (e^x)
1742	Andrers **Celsius**	The **centigrade temperature scale** is invented
1758	Carolus **Linnaeus**	"**Father of Modern Taxonomy**" This Swedish biologist devised a system still used today for naming organisms. He also firmly abided by & promoted the view that species don't change.
1760	John **Harrison**	British clock maker who invented the modern **chronometer** (an extremely accurate clock)
1768	Captain James C. **Cook**	First voyage of discovery
1769	Benjamin **Franklin**	Publishes the first chart showing an ocean current (the **Gulf Stream**), his interest arose from wondering why it took 2 weeks longer to go from London to New York, than to go from New York to London Also known for inventing: lightning rod, bifocals, carriage odometer, etc.
1796	Edward **Jenner**	Used "**cow pox**" inoculations to **immunize** humans against **small pox**
1798	Thomas R. **Malthus**	"An Essay on the Principal of Population" in which he observed that sooner or later populations get checked by famine, disease, & widespreak mortality; he criticized the idea that agricultural improvements would allow populations to expand without limit

1800s	William **Ferrel**	American scientist who discovered **mid-latitude circulation cells** of each hemisphere
1800s	Antoine **Risso**	Italian physician who observed scientific trawling & recorded his observations about it; while his concept of "paleo-depth indicators" (species indicate depth) was wrong, his idea that **depth indicates change** was correct & later influenced ***Forbes***
1801	J-B de **Lamarck**	Invents the term "**Invertebrate**" & published *Système des animaux sans vertèbres*, a major work on the classifications of invertebrates.
1802		He becomes one of the first to use the term "**biology**" on its modern sense. Overall, he is known for his work in **invertebrate zoology** & his theory of **inheritance of acquired characters** (a.k.a. "soft inheritance" or "Lamarckism").
1812	Ferdinand **Cohn**	suggested that **microbes** were involved in the **cycling** of all **matter**
1818	John **Ross**	Takes first deep-water & sediment samples; **deepsea life at the poles** & the "**emergence hypothesis**"
1820s	Charles **Cagniard-Latour**	described **yeast** as non-motile organized globules capable of reproduction by budding & probably belonging to the "vegetable kingdom"
1822	Enrico **Acerbi**	theorized that **parasites** existed & were capable of entering the body & their multiplication **caused typhus fever**

Who are the following **Famous Scientists/Oceanographers?**

1830s	Justus von **Liebig**	invented **Nitrogen-based fertilizers, &** later developed the hypothesis of "**Law of the Minimum**" in which he argued that fertilizing with only Nitrogen would deplete the minerals from the soil, & the least abundant mineral in the soil with limit plant growth no matter how plentiful the other minerals may be
1831	Charles **Darwin**	Departs on a 5-year voyage aboard the **HMS *Beagle***
1859		***Origin of Species*** which put forth the idea that different species arise through **isolation**
1835	Gaspard Gustave de **Coriolis**	Publishes the 1st papers on the motion of bodies on a rotating surface, later known as the "**Coriolis Effect**"
1836	William **Harvey**	Devises a taxonomy of **seaweeds**
1837	Friedrich **Kutzing**	he described the nucleus of the cell & developed the concept that all fermentation was caused by living organisms
mid-1800s	J.D. **Dana**	geologist who studied **mountain-building**, **volcanic activity**, & the origin & structure of **continents** & **oceans**
mid-1800s	Captain Charles **Wilkes**	**The South Seas Expedition** (aka the "Wilkes Expedition")
1843	Edward **Forbes**	**"Azoic Ocean Hypothesis"**: no organisms below 300 fathoms (proven wrong, relationship between light & benthic algae should be an exponential decline not linear as he thought)
1847	Han Christian O**ersted**	Observes **plankton**
1848	Lord **Kelvin**	he studied **thermodynamics** & developed the basis of **Absolute Zero**
1848	Alfred C. **Wallace**	departs on a 4-year voyage aboard the *Mischief,* where he explored the **Amazon rainforest.**
1854		Wallace spends 8 years traveling through Malaysia & Indonesia.
1858		He sends an article outlining his theory of **Natural Selection** to Darwin, it was published, along with a description of Darwin's theory that same year.
1876		Publishes *The Geographical Distribution of Animals*.
		Overall, known for co-discovery of theory of **Natural Selection** & his work on **biogeography**
1851	George Gabriel **Stokes**	"**Stokes Law**": calculating the terminal velocity for a sphere falling in a viscous medium. He derived an expression for the frictional (drag) force exerted on sperical objects with very small **Reynolds numbers**
1853	John **Snow**	"**Father of Modern Epidemiology**;" made the first connection between **infectious diseases** & drinking **water** contaminated with **sewage (Cholera)**
1855	Matthew **Maury**	Publishes *Physical Geography of the Seas* , in which he assembled information from ship's logs into **coherent wind** & **current charts**
mid-1800s	Gregor J. **Mendel**	"**Father of Modern Genetics**" He discovered a mechanism of inheritance while conducting experiments on garden peas while working at an Austrian monastery.
1857	T. H. **Huxley**	Theory of **Glaciers**; supported ***Darwin's*** theory of **Evolution** & described his own religious views as "**Agnostic**"
1861	James Clark **Maxwell**	created the first true **color photograph**; "A dynamic theory of the **electromagnetic field**" & "**Maxwell Distribution**" (a statistically describes aspects of the **kinetic theory of gases**)

Who are the following **Famous Scientists/Oceanographers?**

1862	Louis **Pasteur**	Developed the **pasteurization** process to prevent beverages from spoiling
1870s		Work on **immunizations** for **anthrax**, **cholera**, & **rabies;** he was also known for developing **sterilization** techniques that lead to autoclaves
1865	Johann G. **Forchhammer**	"Forchhammer's Principal" a.k.a. "**Principal of Constant Proportions**" which shows that the **ratio** of **major salts in seawater** from various locations is **constant**
1867	Joseph **Lister**	"**Father of Modern Antisepsis**," developed surgical **sterilization techniques**
1872-1876	Sir-Wyville **Thompson**	went on the **Challenger Expedition** & published his accounts of **dredging** done on this voyage in "The Depths of the Sea"
1877	Alexander **Agassiz**	Begins his dredging research aboard the **steamer *Blake***
1880s-1900	Sergei **Winogradsky**	"**Father of Soil Microbiology**"
		Discovered the 1st known form of chemoautotrophy, biological nitrification: he studied **sulfur-oxidizing bacteria** & found that the bacteria ***Beggiatoa*** could utilize inorganic H_2S as an Energy Source & atmospheric CO_2 for carbon in the synthesis of cellular material --> **Winogradsky Column**
		Ecological classification system of **Autochthonous (K)** versus **Zymogenous (R)** organisms
1880	William **Dittmar**	Determines major **salts** in seawater
1883	Osborne **Reynold**	**Reynold's Number** (**Re**) : describes the balance between **inertial** & **viscous forces** Popularized *G.G.* ***Stokes*** concept
1887	Victor **Hensen**	coined the term "**plankton**" & laid the foundation for **biological oceanography**
1887	R. J. **Petri**	developed the **petri dish** for **culturing bacteria**
1888	Spencer Fullerton **Baird**	Established **Woods Hole**
1890	Alfred Thayer **Mahan**	Publishes *The Influence of Sea Power upon History*
1890	Robert **Koch**	**Koch's Postulates** were published
1905		Nobel Prize for his work on Tuberculosis
1891	Sir John **Murray**	Classify **marine sediments**
1891	Alphonse **Renard**	**Classify marine sediments**
1893	Fridtjof **Nansen**	Led the first successful crossing of the **Arctic** while aboard the ***Fram***
1898		1st to describe **Ekman**–type processes by quantitatively showing why **wind** caused **water motion** to not be **20°-40°** to the **right** of the wind direction in the Northern Hemisphere
1922		the only oceanographer to win a Nobel Prize (for his humanitarian efforts)
1894	Max **Plank**	**Black-body radiation**
1895	Rudolf **Diesel**	invents diesel engin
1895	Guglielmo **Marconi**	invents **wireless telegraph**

Who are the following **Famous Scientists/Oceanographers?**

1898	Martinus **Beijerinck**	Described **viruses** for the first time, he also discovered **nitrogen-fixing bacteria**
1900s	Ludwig **Boltzmann**	developed the **Boltzmann equation to describe the dynamics of an** ideal gas
1900s	R. A. **Fisher**	created the foundations for modern statistical science; known for : **Analysis of Variance (ANOVA)**, **Maximum Likelihood**; **z-distribution;** & his contributions to the field of **non-parametric statistics**
1900	Richard D. **Oldham**	Identifies **P** & **S waves** on seismograph
1900	Carl David **Runge** & M. W**. Kutta**	co-developed the **Runge-Kutta** method used to solve ordinary **differential** equations numerically
1902	V. Walfred **Ekman**	quantitatively explained the **deflection** for an idealized ocean
1903	Lord **Rutherford**	"**Father of Nuclear Physics**" discovered **radioactive half lifes**
1911		**Rutherford mode**l of the **atoms:** very small positively-charged nucleus orbited by electrons
1906	Prince **Albert I**	The Prince of Monaco establishes the Institut océanographique
1907	Bertram **Boltwood**	Calculates the **age of Earth** through **radioactive decay**
1909	Paul **Ehrlich**	Discovered the "**magic bullet"** cure for **syphilis** (a protozoan infection)
1909	Ole **Evinrude**	invents outboard engin
1909	Admiral Robert **Peary**	the first person to reach the **geographic North Pole**
1910-1930s	Alfred J. **Lotka**	**Lotka-Volterra model** (a **Predator-Prey model**) which uses differential equations to describe **population dynamics**
1911-1912	Roald **Amundsen**	First person to reach both the **North** & **South Poles**
1912	Alfred **Wegener**	Lectures on **Continental Drift**
1913	Leonor **Michaelis** & Maud **Menten**	**Michaelis-Menten** equation relates the initial reaction rate ($\mathbf{v_0}$) to the **substrate consentration** (**S**) in which the maximum rate is the $\mathbf{v_{max}}$ asymptote
1916	Federic **Clements**	studied **plant communities** & found that modified assemblages would **react predictably** through **biological control** (**Succession** --> **Climax Species**); *see **Gleason***
1917	Joseph **Grinnell**	coined the term "**niche**"
1918	Vilhelm **Bjerknes**	Formulates theory of **atmospheric fronts**, & discovered the nature & formation of **extratropical cyclones**, which cause most **mid-lattitude weather**
1920s	Henry **Gleason**	studied altered **plant communities** & found that they didn't always return to the same state, instead he found that communities are formed through **physical change** *see **Clements***
1923	Sir Gilbert **Walker**	noticed the shifts in **atmospheric pressure differences** between the **Indian** & **Pacific Ocean**, later to become known as the ***Southern Oscillation Index (SOI)***
1924-1994	Paul P. **Yevich**	Pathobiology…"the wonderful world of unknowns"
1928	Albert Jan **Kluyver** & Cornelius B. **van Niel**	worked together to develop equations for **Respiration** & **Photosynthesis**

Who are the following **Famous Scientists/Oceanographers?**

1930s	Otis **Barton** & William **Beebe**	1st humans to each ½ mile deep in the bathysphere; *see **Beebe***
1930s-1940s	Jacques **Monod**	**Monod equation** which is the first & simplest description of how **substrate concentration affects growth**
1934	Alfred C. **Redfield**	**Redfield ratio**: describes the ratio between **nutrients** in **plankton** & **ocean water, C:N:P = 106:16:1**
1942	Melvin **Calvin**	discovered the **Calvin Cycle** & in 1961 won the Nobel Prize in chemistry for this work
1943	Jacques **Cousteau** & Emile **Gagnan**	Invent the **SCUBA** regulator & tank combination, known as the "**aqualung**"
1946	**Karl Popper**	Founded the Department of Philosophy, Logic & **Scientific Method** at the London School of Economics; he described his philosophy as "**critcal rationalism**"
1946	Gordon **Riley**	importance of **stratification** in initiating the **Spring Bloom** of Phyto- & Zooplankton
1947	Howard **Sverdrupt**	Connection between the **Wind** & the **Equatorial** & **Eastern Boundary Currents**
1953		proposed the **Critical Depth** (depth at which photosynthesis = respiration) model to explain the rapid growth & accumulation of phytoplankton biomass in the spring
1948	Henry **Stommel**	showed that it is the **variation** of the **Coriolis Parameter** with **latitude** that causes the **intensification** of the **Western Boundary Currents** in major ocean gyres
1949	William M. "Doc" **Ewing**	Forms the Lamont-Doherty Earth Observatory
1949	Edward H. **Simpson**	**Simpson's Diversity Index (D):** in highly diverse communities there's a decreased risk of encountering the same species twice (works best when talking about the most abundant species & not the whole community), **Probability theory**
1950	Walter **Munk**	combined the concepts of *V. Walfred **Ekman***, *Harald **Sverdrup***, & *Henry **Stommel*** to explain the main features of the **entire wind-driven circulation** pattern
1950s-present	Karl **Banse**	studied phytoplankton
1950s-present	Charles R. **Goldman**	studied **eutrophication of lakes** (**Lake Tahoe** in California/Nevada), **nutrient limiting factors**, impact of climate change & weather, & time-series data
1950s-present	Tom **Goreau**	Caribbean **Reef Zonation** : Shore, Lagoon, Back reef, Breaker zone (*A. palmata*), Butress zone (*A. cervicornis*), & *Montastrea annularis* zone Impacts of **Climate change** on reefs, & is now the president of the **Global Coral Reef Alliance**
1953	Howard T. **Odum** & Eugene **Odum**	published *Fundamentals of Ecology, Howard* wrote about **energetics** & introduced his **energy circuit language** (**energese**) & *Eugene* wrote about **ecosystem ecology**
1956	Eugene **Smith**	chronicaled the history of a small Japanese fishing town, **Minamata**, that got **mercury** poisioning from a local chemical factory
1957	Bruce **Heezen** & Marie **Tharp**	**created the Heezen-Tharp Map** which was the first map of the **ocean floor** that included **Mid-Ocean Ridges**
1957	G. Evelyn **Hutchinson**	popularized *Joseph **Grinnell's*** concept of niches; **niches** are "**n**" **dimension hyperspacce**

Who are the following **Famous Scientists/Oceanographers?**

1960s	Ramon **Margalef**	the present animal community came from a previous set of communities & will evolve into a new set of communities controlled by certain parameters (Information Theory)
1960	Jacques **Piccard** & Don **Walsh**	1st men to reach the deepest location in the ocean, the **Mariana Trench**, which is 10,915 meters (35,801 feet) deep
1961	J. H. **Connell**	**selective pressures** related to **predation** & **competition** for space in the **rocky intertidal**
1961	Charles David **Keeling**	The "**Keeling Curve"** measures the progressive buildup of **CO_2** in the atmosphere
1962	Rachel **Carson**	Publishes ***Silent Spring*** & initiates the U.S. environmental movement
1962	Harry H. **Hess**	known for his theory of **Sea Floor Spreading** & his suggestion that this processes was driven by **convection** of the Earth's **mantle**
1965	John Tuzo **Wilson**	Canadian geophysicist who proposed the **theory of plate tectonics**
1966	Bob **Paine** & John/Joan **Ruthguard**	the key to **diversity** lies in **explaining the gaps**, worked together on **Population & Community Theory** in NW Coast's rocky intertidal zone
1967	Richard C. **Dugdale**	**Nutrient limitation** in the sea & uptake of new & regenerated forms of **nitrogen** in primary productivity
1967	Alan **Longhurst**	"Vertical distribution of zooplankton in relation to the eastern Pacific oxygen minimum"
1989		"Biological Pump..."
1991		"Role of the Marine Biosphere in the global carbon cycle"
1995		"Seasonal cycles of pelagic production & consumption" & Estimated global primary production in the ocean using satellite radiometer data
2007		"Ecological Geography of the Sea"
1968	Paul Ralph **Ehrlich**	***The Population Bomb***
1969	John **Holdren**	he & *Paul **Ehrlich*** wrote that **overpopulation** was a problem, since then his work has focused on the causes & consequences of **global environmental change**; he's currently **Obama's science advisor**
1969	John **Ryder**	studied the **Maximum Sustainable Yield** (**MSY**) in the Peruvian fishery
1970	O.J. **Koblentz-Mishke**	"**Plankton primary production** of the world ocean"
1970	Lynn **Margulis**	"Origin of **Eukaryotic** Cells"
1971	Paul **Dayton**	benthic communities are **diverse** because they're disturbed; this disturbance must be targeted: **Lotka-Voltera** + **targeted disturbance** = **diversity**
1971	Thomas C. **Malone**	food web
1973	Arnfried **Antonius**	discovered Black Band Disease on scleractinian corals
1974	Larry **Pomeroy**	***Ocean's Food Web: A Changing Paradigm*** in which he said that **microbes** played a key role in marine productivity
1975	John **Hobbie**	his paper entitled "**Direct counts** of **Aquatic Bacteria** by a Modified Epifluorescence Technique" is one of the most cited papers in all of ecology

Who are the following **Famous Scientists/Oceanographers?**

1975	Reuben **Lasker**	**Stable Ocean Hypothesis**: stability is necessary for **phytoplankton blooms**, larvae take advantage of this by staying with prey patches
1976	Robert **May**	you don't have to solve the equation fully, you only need to know certain parameters to show the equilibrium will still work out to 1 species surviving
1977	John **Baross**	discovered **Black Smokers**
1977-present	J.B.C. **Jackson**	"Reefs since Columbus," coral paleoecologist who said that **corals** are a **tropical, Western Boundary phenomena** because of upwellings (Eastern Boundaries are too cold)
1979	Richard **Eppley** & Bruce **Peterson**	discovered the **F-ratio** which is the fraction of total primary production fueled by **nitrate** which they used to estimate **global oceanic primary production**
1980	Colleen **Cavanaugh**	Suspects **chemosynthesis** in **tubeworms**
1981	H. **Felback**	**chemosynthesis** in **mussels**
1981	Michael **Rex**	**deep sea diversity** in the NW Atlantic has the highest diversity at intermediate depths of 2,000-2000m
1983	Tom **Fenchel**	coined the term "**Microbial Loop**" in a paper which supported *Larry **Pomeroy's*** hypothesis
1985	Robert **Ballard**	Finds wreck of ***Titanic***, but didn't discover chemosynthesis in hydrothermal vents
1985	Jorg **Imberger**	modeled the **mixed-layer** dynamics of lakes, studies the underlying transport & mixing processes that control the health of the lake ecosystem
1986	John **Martin**	**Iron Hypothesis**: iron deficiency prevents phytoplankton blooms, it was first tested in 1993
1987	Robert **Hessler**	**hydrothermal vent ecology** & **deepsea biodiversity**
1988	Akihiko **Hattori**	studied **nitrate respiration** by marine **bacteria**
1990	David **Cushing**	The **Match/Mismatch hypothesis** which focused on timing, as a function of **climate change**, of **blooms** of **primary producers** (**phytoplankton**)
1991	Wallace Smith **Broecker**	periodically the **Global Ocean Conveyor shuts down** & deep water formation stops & causes an ice age to begin
1994	Robert **Aller**	he created **Bioturbation** mathematical models
2002	Peter J. LeB **Williams**	contributed to our understanding of **oceanic productivity, carbon cycling, metabolic balance,** & the importance of **microbial processes** in the oceans

Arnold **Bawma**	the LSU professor who invented the **Box Core**
Nancy **Knowlton**	a coral microbiologist (married to *J.B.C. **Jackson***)
Jack **Mosick**	used **cluster analysis** to show **zonation with depth**
Don **Rhodes**	Yale professor trained as a paleontologist who studied **animal/sediment interactions**
Howie **Sanders**	
Joe **Siebenaller**	studies **deep sea pressure**
John **Steel**	
Steele	
Steeman-Nielson	**C-14**
Henry **Stokarv**	
Rudy **Strichler**	
Van't **Hoff**	**Van't Hoff Rule**
Mikhail **Vinogrudov**	
Whittiker	updated **Naming System**
Rachel **Wood**	in modern oceans the **greatest saturation** of **aragonite** is between **15˚-20˚ N/S**
Woss	updated **Naming System**