CARD-tamen™

ludi sine fine

play without end

periclesgroup.org

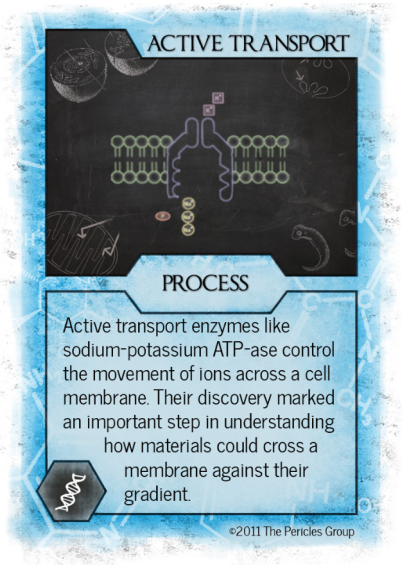
THE TPG PERICLES GROUP

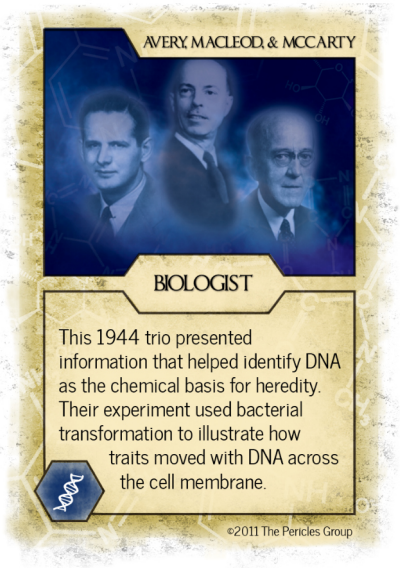
STANDARD RULES

1. Deal seven (7) CARDs to each player. The player to the dealer's left goes first.
2. The first player chooses a controversy from the included CARD labeled "Controversies", and a CARD from his or her hand, and announces the controversy chosen as he or she lays down the CARD.
3. The player to his or her left may take up the challenge or pass.
4. If the second player has passed, the third player MUST take up the challenge.
5. A player takes up a challenge by playing a CARD and beginning a one minute speech in favor of his or her chosen CARD.
6. The first player then makes a one minute speech in favor of his or her chosen CARD.
7. The player who is not involved in the challenge serves as the iudex. Both CARDs are awarded to the player chosen by the iudex as the winner.
8. CARDs awarded are placed in front of the player to be counted at the end of the CARD-tamen™.
9. The turn passes to the left, and play continues until one player is out of CARDs.
10. The winner of CARD-tamen™ is the player with the most CARDs in front of him or her.

Controversies: (d20)

1. More critical to laboratory research
2. More important to the study of life
3. More important to the survival of mankind
4. Less appreciated
5. Greater contribution to the field of biology
6. Greater potential for future study
7. More critical to life on Earth
8. More fascinating
9. More useful
10. More complex
11. Capable of inspiring more stories
12. More important to science history
13. More useful in studying global climate change
14. More likely to contribute to medical science
15. More related to other fields of science
16. Less critical to life on Earth
17. Greater contribution to genetic engineering
18. Better icon for biology
19. More favored in laboratories
20. More favored in field research





THE TPG PERICLES GROUP FOUNDATION

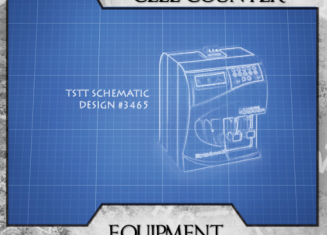
Visit: periclesgroup.org for more info.

BLUE WHALE

ORGANISM

Blue whales are the largest known animals to have ever existed. Despite weighing over 200 tons and being more than 100 feet in length, their primary food source is krill, one of the smallest organisms on earth.

CELL COUNTER



EQUIPMENT

Cell counters make it possible to count cells on Petri dishes or in test tubes. When using a Petri dish, the plate is divided into quarters; all of the colonies in one quarter are counted and multiplied by the total number of divisions.

CENTRIFUGE

EQUIPMENT

A centrifuge uses an electric motor to rotate objects around an axis at high speed. The term centrifugal force comes from the perpendicular motion of substances away from the centrifuge axis as the motor spins.

CHARGAFF

BIOLOGIST

Chargaff facilitated the discovery of DNA's double-helix structure by asserting equal ratios of adenine to thymine and guanine to cytosine. These ratios established which nucleotides were bound to one another.

COELACANTH

ORGANISM

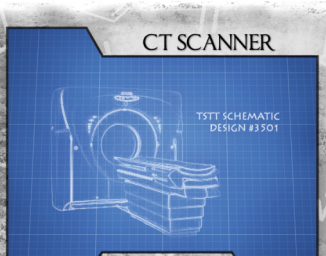
Coelacanths are thought to have evolved approximately 400 million years ago and were considered extinct until their rediscovery off the coast of South Africa in 1938. They are close relatives of the lungfish and are considered living fossils.

CORPSE FLOWER

ORGANISM

Also known as the titan arum, corpse flowers can reach over 10 feet in height and have the largest unbranched inflorescence of any known plant. Their distinct odor resembles that of a decaying animal, primarily to attract pollinating insects.

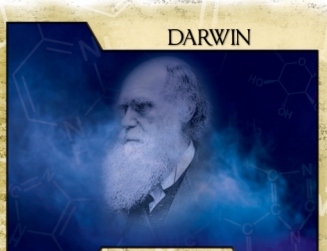
CT SCANNER



EQUIPMENT

Computed tomography (CT) is used in medical imaging to generate a three-dimensional image of the inside of an object using a series of x-rays. It most often assists with preventative medicine, making cancerous cells easier to see.

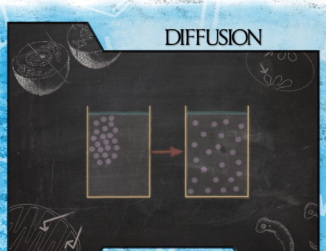
DARWIN



BIOLOGIST

Charles Darwin was a British naturalist who established that all species descended from a common ancestor through the process of evolution. Much of his research came from his global voyage aboard the HMS Beagle.

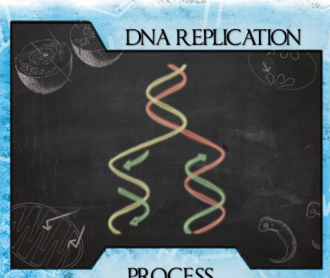
DIFFUSION



PROCESS

Whenever a liquid or gas is released into an open volume of space, its composite particles will separate until they are evenly distributed in that volume. This is because the thermodyanamic energy contained in each molecule will cause it to bounce off of others.

DNA REPLICATION



PROCESS

Replication is the biological process through which DNA is copied. The original strand is unzipped by an enzyme called helicase; two semi-conservative strands are built from new nucleotides that attach to the unzipped halves.

DROSOPHILA

ORGANISM

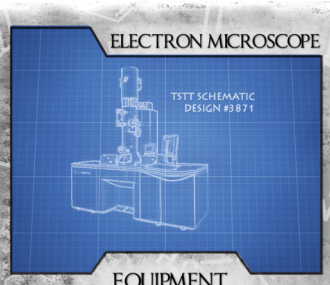
Despite being a household pest, Drosophila melanogaster, also known as the fruit fly, is frequently used for study in genetics labs. They are readily cultured en masse, and their short generation time makes mutant samples easily obtainable.

DUCK-BILLED PLATYPUS

ORGANISM

These furry creatures are some of the most bizarre mammals on earth. Despite providing milk to their young, they lay eggs and possess venomous spines used to protect themselves from predators.

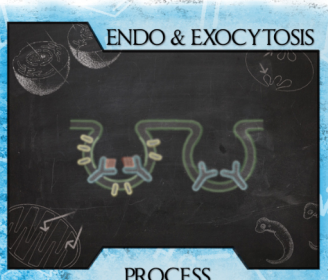
ELECTRON MICROSCOPE



EQUIPMENT

Electron microscopes use electrons' short wavelengths to create digital images of an object. These images can be of the object's exterior (scanning electron micrographs) or interior (transmission electron micrographs).

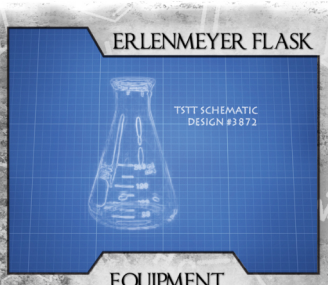
ENDO & EXOCYTOSIS



PROCESS

Endo and exocytosis are the uptake or release of materials into or out of a cell, respectively. One form of endocytosis, called phagocytosis, is a specialized type of `cell eating' practiced by amoebas, leukocytes, and other microorganisms.

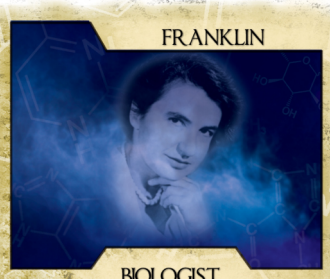
ERLENMEYER FLASK



EQUIPMENT

These cone-shaped flasks, named for the German chemist who invented them, are often used in measuring pH or completing titrations. They can also be configured to prepare and culture a variety of microbes.

FRANKLIN



BIOLOGIST

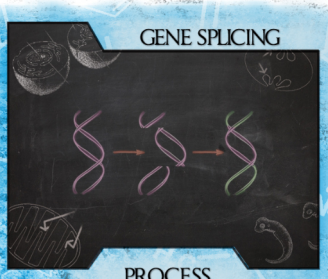
Rosalind Franklin's x-ray diffraction eventually helped Watson and Crick determine DNA's double-helix structure. Though she could not posthumously receive the Nobel Prize for her contribution, she was a key player in the quest for the genetic code.

GALAPAGOS TORTOISE

ORGANISM

Made famous by Darwin's trip to the Galapagos, these giant reptiles are known for their extremely lengthy lifespans. However, while individuals may survive more than 170 years, the species is now considered vulnerable due to poaching.

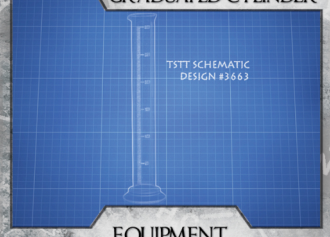
GENE SPLICING



PROCESS

Recombinant DNA technology allows scientists to take samples of genetic material from many sources and integrate it in a way that is not found in nature. This has made it possible to create chimeric sequences from two or more species.

GRADUATED CYLINDER



EQUIPMENT

A graduated cylinder is extremely helpful in determining the exact volume of a liquid. They are typically made of glass or plastic and can measure solid volumes through water displacement.

HERSHEY & CHASE

BIOLOGIST

In 1952, Alfred Hershey and Martha Chase confirmed that DNA was responsible for genetic inheritance. Of all the radioactive materials used in the test, only DNA was transferred from the parent virus generation to their offspring.

HOMO NEANDERTHALENSIS

ORGANISM

Neanderthals are considered the closest relatives to modern Homo sapiens, sharing 99.5 - 99.9% of our genome. Several theories have been generated to explain their extinction; including their interbreeding with humans.

HOOKE

BIOLOGIST

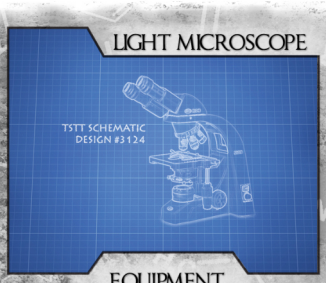
Robert Hooke was a philosopher and scientist of the late 1600s. He was the first to describe microscopic biological organisms as cells, noting similarities in structure between segments of a cork plant and monks' living quarters.

LEEUWENHOEK

BIOLOGIST

Anton von Leeuwenhoek greatly improved the design of the microscope and was the first to note similarities between single-celled organisms and other animals, calling them animal molecules, or animalcules.

LIGHT MICROSCOPE



EQUIPMENT

Possibly the most fundamental biology tool, the light microscope uses visible light and a series of lenses to magnify otherwise tiny samples for the naked eye.

MCCLINTOCK

BIOLOGIST

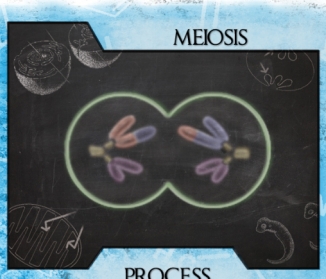
Barbara McClintock was a Nobel laureate in Physiology and Medicine, known as one of the world's greatest geneticists. She famously discovered jumping genes in maize, sections of DNA that turn physical traits on and off.

MEGALODON

ORGANISM

Megalodon is an extinct species of shark that ravaged the oceans during the Cenozoic Era between 28 and 1.5 million years ago. It measured more than 50 feet in length and largely resembled the great whites of today.

MEIOSIS



PROCESS

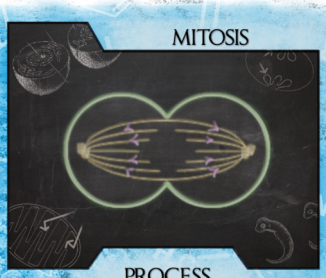
Unlike mitosis, meiosis halves the amount of DNA in a cell for the purposes of gamete production. These specialized gametes, also known as sperm and eggs, bind during sexual reproduction to increase genetic variation among offspring.

MENDEL

BIOLOGIST

Gregor Mendel's breeding of pea plants eventually led him to uncover the mysteries of inheritance. While he did not know the underlying mechanism, he was able to use ratios to determine phenotypic probabilities.

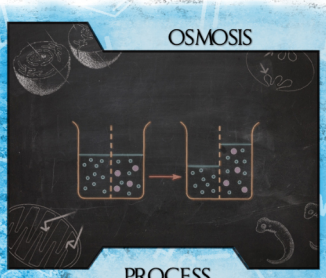
MITOSIS



PROCESS

Mitosis is the process by which eukaryotic cells duplicate and separate their chromosomes into two identical nuclei. Once genetic division is complete, cytokinesis typically splits the parent cell into two daughter cells, each with its own nucleus.

OSMOSIS



PROCESS

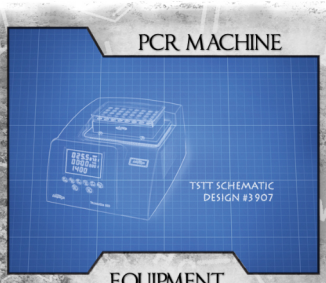
Osmosis is the diffusion of water across a semi-permeable membrane. When a higher concentration of water molecules exists on one side of the membrane, they will tend to cross it until equal distribution is achieved.

PASTEUR

BIOLOGIST

Louis Pasteur is known for his impact on microbiology. He reduced human mortality through his germ theory and coined the process by which milk, wine, and juice are now made safe for consumption (known as pasteurization).

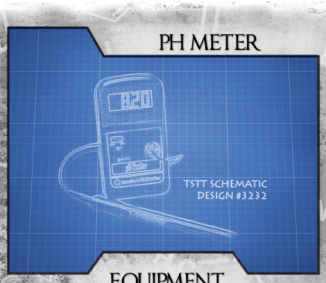
PCR MACHINE



EQUIPMENT

Also known as thermal cyclers, PCR machines amplify small amounts of DNA through polymerase chain reactions. As the temperature increases and lowers, free bases bind to the original DNA to make copies.

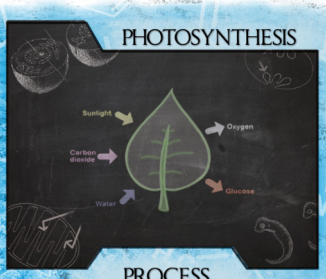
PH METER



EQUIPMENT

This electronic instrument functions when its glass probe is inserted into a liquid. The probe detects the presence of hydrogen and hydroxide ions, then displays how acidic or basic the substance is on an attached screen.

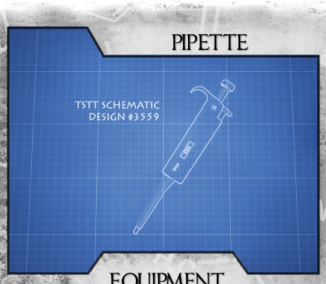
PHOTOSYNTHESIS



PROCESS

Using a specialized green substance called chlorophyll, plants, algae, and many types of bacteria are able to covert carbon dioxide, water, and sunlight into oxygen and glucose. This process is essential for the survival of all aerobic life on earth.

PIPETTE



EQUIPMENT

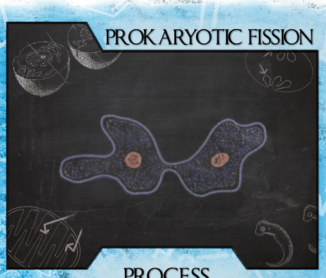
Pipettes are laboratory chemical droppers used to move small volumes of liquid from one place to another. They are common in molecular biology and medicine. When calibrated properly, they are extremely accurate.

PRAYING MANTIS

ORGANISM

Mantises represent more than 2,000 species of insects that live in tropical and temperate habitats all over the world. The title `praying' comes from their unique prayer-like stance, though many people mistake it for `preying' due to their predatory nature.

PROKARYOTIC FISSION



PROCESS

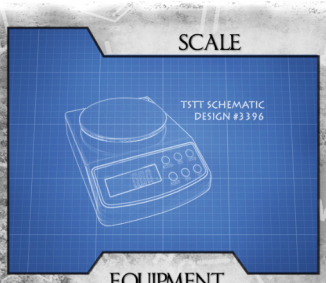
Fission is a form of asexual reproduction during which prokaryotic organisms duplicate their genetic material and split into two or more daughter cells. This differs from mitosis due to the fact that prokaryotic cells do not possess nuclei.

SALK

BIOLOGIST

Jonas Salk was responsible for discovering the vaccine for polio. Though he had the opportunity to profit from his work, he opted to give it away for no personal gain, hoping only to end the tragic viral epidemic.

SCALE



EQUIPMENT

Scales are used to determine an object's weight or mass. In biology, scientists use these devices to calculate volume and create solutions like buffers.

SIERRA REDWOOD

ORGANISM

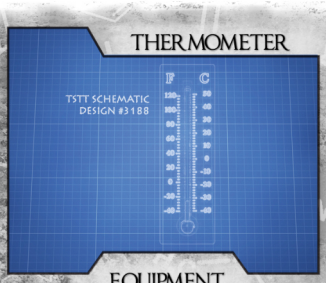
Giant sequoias like the Sierra Redwood are the world's largest form of plant-life. They are native to western California and can live for more than 3,000 years; the oldest known redwood has been alive for as long as the existence of written language!

TYRANNOSAURUS REX

ORGANISM

The king tyrant lizard was one of the most terrifying carnivores ever to walk the earth. Tyrannosaurs lived 65 million years ago and were among the last non-avian dinosaurs. They met their end during the Cretaceous extinction event.

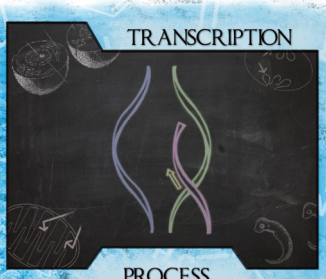
THERMOMETER



EQUIPMENT

When the bulb of a thermometer is inserted into a substance, the internal liquid rises or falls based on the degree of heat energy in the substance. Markings on the tube indicate the temperature in Celsius or Fahrenheit.

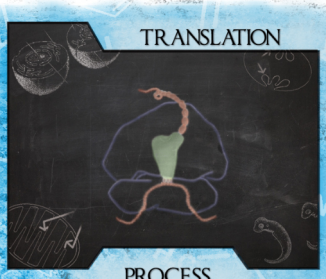
TRANSCRIPTION



PROCESS

In order to create new proteins, cells must synthesize complementary RNA strands from sequences of DNA. However, unlike replication, RNA copies of the original DNA strand contain uracil in place of thymine.

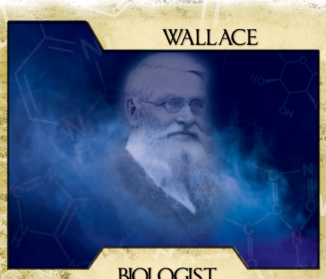
TRANSLATION



PROCESS

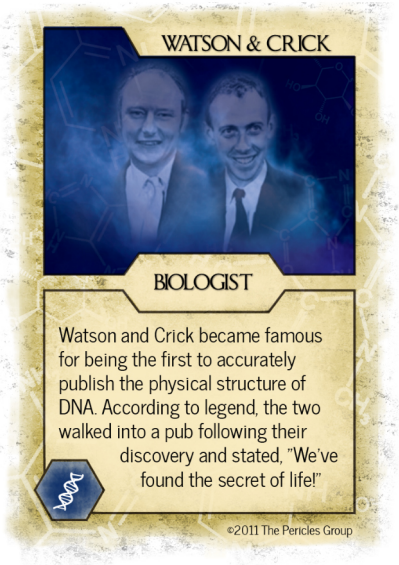
Translation is the third stage of protein synthesis. mRNA strands are converted to amino acid chains through the use of codons; when the RNA enters a ribosome, amino acids are bound to one another in a chain that will eventually fold into a complete protein.

WALLACE



BIOLOGIST

Though Darwin is typically considered the first to accurately describe evolution, Alfred Wallace proposed the theory of natural selection. Wallace's ideas prompted Darwin to publish The Origin of Species.


WATSON & CRICK
BIOLOGIST
Watson and Crick became famous for being the first to accurately publish the physical structure of DNA. According to legend, the two walked into a pub following their discovery and stated, "We've found the secret of life!"
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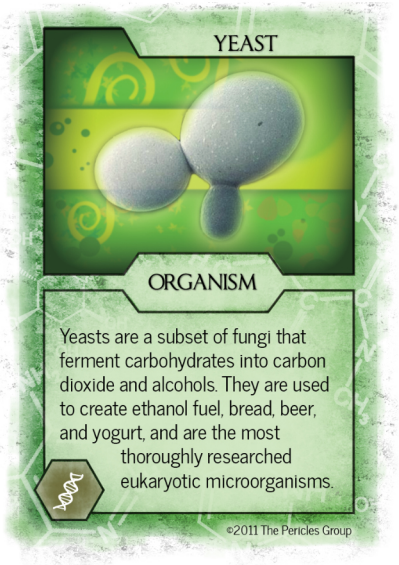
YEAST
ORGANISM
Yeasts are a subset of fungi that ferment carbohydrates into carbon dioxide and alcohols. They are used to create ethanol fuel, bread, beer, and yogurt, and are the most thoroughly researched eukaryotic microorganisms.
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