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Vocabulary Builder Reference from...

Rolf Landua: What happened to antimatter? | TED Talk

https://www.ted.com/talks/rolf_landua_what_happened_to_antimatter

All Words

IMPORTANT

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Session 1: Word List

precise

adj. sharply exact or accurate or delimited

synonym : accurate, exact, distinct

(1) **precise** analyses, (2) estimate **precise** costs

The content is **precise** and informative for me.

twin

n. either of two children born at the same time from the same mother

(1) a **twin-lens** camera, (2) a **twin** room

Its **twin** brothers are difficult to tell apart except for their parents.

antimatter

n. matter made up of antiparticles, which have the same mass as regular matter but opposite electrical charges

synonym : anti-substance, anti-nucleus, antiparticle

(1) **antimatter** propulsion, (2) **antimatter** production

Scientists are studying the properties of **antimatter** to gain a deeper understanding of the universe.

mysterious

adj. difficult to understand, explain, or identify; having an aura of secrecy, intrigue, or puzzlement

synonym : enigmatic, cryptic, puzzling

(1) **mysterious** object, (2) **mysterious** stranger

The **mysterious** disappearance of the ship remains unsolved.

physics

n. the science of matter and energy and their interactions

(1) nuclear **physics**, (2) laws of **physics**

He studied the **physics** of radiation.

formula

n. a group of symbols, letters, or numbers that represent a rule, law, or mathematical statement

synonym: expression, recipe, procedure

(1) structural **formula**, (2) a binomial **formula**

The teacher told the students to memorize the math **formula**.

mass

n. a large amount of a substance with no definite shape or form; a large number of people or things grouped or crowded together

synonym: abundance, crowd, mob

(1) a **mass** of molten rock, (2) critical **mass**

The **mass** of people who do not own property is politically impotent.

concentration

n. the ability to focus all your time and energy on one thing without thinking about anything else.

synonym: attention, engagement, assiduity

(1) **concentration** of armaments, (2) his research area of **concentration**

This exam requires excellent **concentration** to pass.

exchange

v. to give something and receive something else in return, often with the implication that the items being traded are of equal or comparable value; (noun) the act of giving or taking something in return for something else; a place or system where goods or services can be bought, sold, or traded

synonym: trade, swap, interchange

(1) **exchange** rate, (2) **exchange** a few friendly words

My sister and I frequently **exchange** books, as we love

reading.

currency

n. a system of money in general use in a particular country
synonym: money, tender, cash

(1) **currency** exchange, (2) digital **currency**

The **currency** used in this country is the Euro.

trillion

n. the number 1,000,000,000,000; a million million

(1) **trillion** cubic feet, (2) many **trillions** of dollars

One light year is nearly 6 **trillion** miles.

joule

n. the unit of measurement for energy in the International System of Units (SI), equal to the work done by a force of one newton when its point of application moves one meter in the direction of the force

synonym: calorie

(1) measure energy in **joules**, (2) **joule** heating

A 60-watt light bulb uses 60 **joules** of energy per second.

equivalent

n. having the same value, quality, meaning, purpose, etc.

synonym: equal, counterpart, match

(1) **equivalent** amounts, (2) **equivalent** in meaning

The European Central Bank is Europe's **equivalent** of the Federal Reserve.

gram

n. a metric unit of weight equal to one-thousandth of a kilogram

(1) centimeter- **gram-second** system, (2) **gram** amount

How much is it per one hundred **grams**?

transform

v. to change in outward structure or looks;

synonym: alter, convert, change

(1) **transform** an education system, (2) **transform** heat into power

My father's death **transformed** my life completely.

magic

n. beliefs and actions employed to influence supernatural beings and forces; any art or performance that invokes supernatural powers

synonym : fascination, illusion, wizardry

(1) a **magic** spell, (2) she is **magic**

He performed **magic** tricks with sophisticated moves.

density

n. the quality of compactness of a substance

synonym : tightness, viscosity

(1) population **density**, (2) higher pixel **density**

Do you know the **density** of the population in Hong Kong?

particle

n. a small piece of something; a word or piece of a term with grammatical function but little or no significance

synonym : atom, grain, bit

(1) charged **particle**, (2) **particle** energy

We can calculate the position of the **particles** statistically.

counterpart

n. a person or thing that corresponds to or has the same function as another person or thing

synonym : equivalent, analogue, match

(1) **counterpart** agreement, (2) negotiating **counterpart**

His **counterpart** in the other company is responsible for marketing.

antiparticle

n. a subatomic particle that has the same mass and opposite charge as its corresponding particle (e.g., a positron is the antiparticle of an electron)

synonym : opposite, antimatter, anti-substance

(1) **antiparticle** physics, (2) **antiparticle** collisions

When an **antiparticle** meets its corresponding particle, the two annihilate.

fiction

n. the type of book or story, especially novels, that describes imaginary events and people; anything made up or imagined that is not true

synonym : fantasy, fable, invention

(1) stuff of science **fiction**, (2) non- **fiction** bestseller
Truth is stranger than **fiction**.

accelerate

v. to make something faster or earlier; to cause to develop or progress more quickly

synonym : speed up, quicken, rev

(1) **accelerate** a chemical reaction, (2) **accelerate** the car
The government tried to **accelerate** the commercialization of this development.

collision

n. an instance of two or more objects or entities crashing into each other, usually resulting in damage, impact, or conflict

synonym : crash, impact, smash

(1) **collision** detection, (2) come into **collision** with my friend

The **collision** of tectonic plates can result in new mountain ranges, such as the Himalayas or the Alps.

proton

n. a very small particle with a positive charge equal to the negative charge of an electron that forms part of the nucleus of all atoms

(1) **proton** decay, (2) **proton** conductivity

The solar wind is composed almost entirely of electrons and **protons**.

collide

v. to hit something violently when moving

synonym : clash, slam, contradict

(1) **collide** head-on, (2) **collide** in midair

The interests of the two countries **collide**.

electron

n. a tiny particle with the negative electrical charge

synonym : negatron

(1) flow of **electrons**, (2) beam of **electrons**

The outermost **electron** shell determines the chemical properties of an atom.

negative

adj. having the quality of something bad or harmful; expressing refusal

synonym : minus, adverse, pessimistic

(1) have a **negative** effect, (2) a **negative** number

The movie has received almost universally **negative** criticism.

positron

n. an antiparticle of the electron with a positive charge that has the same mass as the electron but an opposite charge

synonym : antielectron, antiparticle, positronium

(1) **positron** emission, (2) **positron** annihilation

Positron emission tomography, or PET, is a medical imaging technique.

opposition

n. the act of disagreeing or resisting; the state of strong disagreement

synonym : resistance, hostility, antagonism

(1) **opposition** campaign, (2) meet with **opposition**

The **opposition** party strongly disagreed with the government's proposed legislation.

identical

adj. being the exact same one

synonym : duplicate, exact, analogous

(1) pair of **identical** twins, (2) an **identical** equation

Infant formulas are nutritionally almost **identical** to a mother's breast milk.

stable

adj. firm and steady; not easily moved, disturbed, or changed

synonym : sturdy, unmoving, durable

(1) in **stable** condition, (2) have a **stable** job

Relations between the two countries have been relatively **stable** due to the summit meeting.

cousin

n. the child of your aunt or uncle

synonym : relative

(1) cross- **cousin** marriage, (2) **cousin's** family
I used to play with my younger male **cousins** when I was a little girl.

convinced

adj. completely certain about something; having a strong belief or conviction in a particular religion

synonym: confident, positive, indoctrinated

(1) **convinced** of the idea, (2) **convinced** criminal
The public is **convinced** that the prime minister has committed fraud.

marble

n. a hard crystalline metamorphic rock that has a pattern of lines going through it and takes a high polish used for sculpture and as building material; a small ball made of stone, especially one used in children's games

synonym: stone, rock, sphere

(1) **marble** statues, (2) artificial **marble**

The floor was made of white and black **marble** arranged in a checkerboard pattern.

apparently

adv. based on what you have heard or read

synonym: evidently, obviously, supposedly

(1) **apparently** simple, (2) **apparently** unrelated

The police **apparently** believed this explanation was plausible.

solid

adj. hard or firm; characterized by good substantial quality

synonym: stable, reliable, hard

(1) **solid** ally, (2) **solid** employment measures

The **solid-state** of water is called ice.

disappear

v. to cease to exist or be visible

synonym: fade, evaporate, vanish

(1) **disappear** without a trace, (2) **disappear** after a week

They watched the train **disappear** into the distance.

- flash** *n.* a sudden intense burst of radiant energy; a momentary brightness
synonym: sparkle, gleam, glimmer
(1) a **flash** of lightning, (2) brilliant **flash**
These heavy rains caused **flash** floods on several islands.
- atomic** *adj.* of or relating to atom (= the smallest component of an element)
synonym: tiny, microscopic, nuclear
(1) **atomic** nucleus, (2) **atomic** bomb
Carbon has an **atomic** mass of 12.
- bomb** *n.* a weapon that explodes and is used to kill or injure people or to cause damage to something
synonym: missile, explosive, ammunition
(1) atomic **bombs**, (2) disarm the **bomb**
The use of cluster **bombs** is strictly prohibited by international law.
- combine** *v.* to join or merge to form a single thing or group
synonym: coalesce, cohere, blend
(1) **combine** chemically with another substance,
(2) **combine** augmented reality
Hydrogen and oxygen **combine** to form water.
- harness** *v.* to control and exploit the power of something, especially natural resources that produce energy; (noun) a set of narrow pieces of leather and metal that are used to control or hold in place a person, animal, or object
synonym: rein in, control, (noun) belt
(1) **harness** a horse to a carriage, (2) put a **harness** on my pet
People have been exploring ways to **harness** natural forces and resources since ancient times.
- fuel** *n.* a substance that is typically burned to generate heat or energy

synonym : energy, power, gas

(1) biomass **fuel**, (2) smokeless **fuel**

The **fuel** scarcity most severely impacted the manufacturing sector

spaceship

n. (especially in science fiction) a spacecraft designed to carry a crew into interstellar space

synonym : starship, rocket, spacecraft

(1) a **spaceship** to survey the moon, (2) alien **spaceship**

They launched a crewless **spaceship** into space.

trek

n. a long and difficult journey, typically on foot

synonym : journey, expedition, hike

(1) horseback **trek**, (2) **trek** expedition

He was preparing for a long **trek** through the mountains.

conventional

adj. based on or following traditional rules, standards, customs, etc.

synonym : ancestral, customary, established

(1) a **conventional** style, (2) get a **conventional** loan

She is very **conventional** in her thoughts.

shuttle

n. a vehicle or boat that regularly moves between two places; bobbin that passes the weft thread between the warp threads

synonym : ferry, transport, convey

(1) space **shuttle**, (2) **shuttle** service

The **shuttle** bus will take you to the airport in 15 minutes.

orbit

n. the path of an object around a celestial body, especially a planet, star, or moon, under the influence of gravity; (of medicine) the bony cavity in the skull that houses the eyeball and its associated structures, like muscles, nerves, and blood vessels

synonym : path, course, trajectory

(1) the **orbit** of the moon, (2) a planetary **orbit**

The rocket engine is used to put the satellite into **orbit**.

harvest

n. yields of plants in a single growing season; the period of the year when gathering occurs on a farm

synonym : crop, reaping, yield

(1) a scanty **harvest**, (2) reap a **harvest**

During **harvest**, farmers are incredibly busy.

combustion

n. the act or process of burning something

synonym : burning, burst

(1) internal **combustion** engine, (2) spontaneous **combustion**

Combustion of the people grew until the revolt was unavoidable.

planet

n. any of the nine large celestial bodies that circle in the solar system; any celestial body that revolves around a star

synonym : earth, world, globe

(1) **planet** like the Earth, (2) save the **planet**

Mercury is the closest **planet** to the sun.

observation

n. the act or activity of carefully examining or monitoring something or someone

synonym : watching, notice, reflection

(1) class **observation** day, (2) **observation** instrument

In the hospital, she will remain under constant **observation**.

visible

adj. capable of being seen; or open to easy view

synonym : clear, observable, seeable

(1) **visible** stars, (2) **visible** by X-ray

My home is easily **visible** from the shore.

universe

n. everything that exists, especially all physical matter, including planets, stars, galaxies, and all other forms of matter and energy

synonym : cosmos, macrocosm

(1) theory of the **universe**, (2) expansion of the **universe**

The **universe** is about 13.8 billion years old.

weird

adj. extraordinary, unexpected, or difficult to explain

synonym : bizarre, creepy, peculiar

(1) a **weird** dress, (2) the state of being **weird**

My computer has been acting **weird** recently.

mystery

n. something difficult to understand or explain; a secret or enigmatic quality that adds to the fascination or interest of something; a genre of fiction that involves the solution of a crime or a puzzle

synonym : enigma, puzzle, secret

(1) **mystery** novel, (2) unsolved **mystery**

The **mystery** surrounding the disappearance of the traveler has yet to be solved by authorities.

bang

v. to hit or cause to hit something in a way that makes a loud noise

synonym : crash, hit, smash

(1) **bang** his fist on a desk, (2) **bang** a phone down

My father tried to **bang** mathematics into my head since childhood.

instant

adj. happening immediately, with no delay

synonym : immediate, urgent, moment

(1) get **instant** access, (2) an **instant** reply

His pleasant face turned cold in an **instant**.

initial

adj. of or happening at the beginning; (noun) the first letter of a word, especially a person's name

synonym : basic, primary, beginning

(1) **initial** velocity, (2) an **initial** letter

They took the **initial** step toward reconciliation.

destroy

v. to ruin or damage severely or completely; to eradicate or eliminate completely

synonym : demolish, ruin, obliterate

(1) **destroy** the ecosystem, (2) **destroyed** evidence
The building was **destroyed** in the fire and had to be rebuilt.

enormous

adj. extremely large or great
synonym : huge, giant, gigantic

(1) **enormous** amount, (2) **enormous** potential
Shakespeare's output of poetry was **enormous**.

radiation

n. the energy that comes from a nuclear reaction in the form of rays, waves, or particles and that can be hazardous to health
synonym : dissemination, emission, irradiation

(1) exposure to **radiation**, (2) electromagnetic **radiation**
He tried every possible treatment, including chemotherapy and **radiation** therapy.

observe

v. to watch or notice something carefully, often to gather information or insights; to take note of something or someone; to celebrate or commemorate a special event or occasion
synonym : watch, monitor, scrutinize

(1) **observe** a tradition, (2) **observe** wildlife
It is important to **observe** safety procedures in the workplace to prevent accidents.

stick

v. to put something, usually a sharp object, into something; to restrict yourself to doing or using one certain thing and not change; (noun) a thin piece of wood or other material
synonym : pierce, adhere, stay

(1) **stick** a key in a lock, (2) fire **stick**
You **stick** a bill in the change machine, and the coins pop out.

whatsoever

adv. not at all; no matter what
synonym : in any way, at all, in any respect

(1) **whatsoever** it be, (2) without impact **whatsoever**

He refused to do anything **whatsoever** to help her.

asymmetric

adj. lacking symmetry or balance; not corresponding in size, shape, or degree; characterized by an uneven or unequal distribution or arrangement

synonym : uneven, lopsided, unbalanced

(1) **asymmetric** warfare, (2) **asymmetric** information

The **asymmetric** design of the building made it stand out in the city skyline.

experiment

n. the scientific test conducted to observe what happens and gain new knowledge

synonym : experimentation, investigation

(1) **experiment** design, (2) series of **experiments**

His **experiments** showed highly positive results.

Session 2: Spelling

- | | | |
|------------------------------|----|--|
| 1. tr_____rm heat into power | v. | to change in outward structure or looks; |
| 2. st__k a key in a lock | v. | to put something, usually a sharp object, into something; to restrict yourself to doing or using one certain thing and not change; (noun) a thin piece of wood or other material |
| 3. co___n's family | n. | the child of your aunt or uncle |
| 4. class obs_____on day | n. | the act or activity of carefully examining or monitoring something or someone |
| 5. pr___n conductivity | n. | a very small particle with a positive charge equal to the negative charge of an electron that forms part of the nucleus of all atoms |
| 6. spontaneous com_____on | n. | the act or process of burning something |
| 7. ob_____e wildlife | v. | to watch or notice something carefully, often to gather information or insights; to take note of something or someone; to celebrate or commemorate a special event or occasion |
| 8. sh_____e service | n. | a vehicle or boat that regularly moves between two places; bobbin that passes the weft thread between the warp threads |
| 9. she is ma__c | n. | beliefs and actions employed to influence supernatural beings and forces; any art or performance that invokes supernatural powers |

ANSWERS: 1. transform, 2. stick, 3. cousin, 4. observation, 5. proton, 6. combustion, 7. observe, 8. shuttle, 9. magic

10. the state of being we__d *adj.* extraordinary, unexpected, or difficult to explain
11. pr___n decay *n.* a very small particle with a positive charge equal to the negative charge of an electron that forms part of the nucleus of all atoms
12. asy_____ic warfare *adj.* lacking symmetry or balance; not corresponding in size, shape, or degree; characterized by an uneven or unequal distribution or arrangement
13. jo__e heating *n.* the unit of measurement for energy in the International System of Units (SI), equal to the work done by a force of one newton when its point of application moves one meter in the direction of the force
14. acc_____te the car *v.* to make something faster or earlier; to cause to develop or progress more quickly
15. app_____ly simple *adv.* based on what you have heard or read
16. exp_____nt design *n.* the scientific test conducted to observe what happens and gain new knowledge
17. centimeter-g__m-second system *n.* a metric unit of weight equal to one-thousandth of a kilogram
18. co_____ed criminal *adj.* completely certain about something; having a strong belief or conviction in a particular religion
19. co_____e head-on *v.* to hit something violently when moving

ANSWERS: 10. weird, 11. proton, 12. asymmetric, 13. joule, 14. accelerate, 15. apparently, 16. experiment, 17. gram, 18. convinced, 19. collide

20. his research area of
con_____ion
21. expansion of the un_____se
22. equ_____nt amounts
23. di_____ar after a week
24. so__d ally
25. higher pixel de_____y
26. en_____us potential
27. in st___e condition
28. ant_____cle collisions
29. equ_____nt in meaning
30. a t__n room
31. many tr_____ons of dollars
32. vi_____e stars
- n.* the ability to focus all your time and energy on one thing without thinking about anything else.
- n.* everything that exists, especially all physical matter, including planets, stars, galaxies, and all other forms of matter and energy
- n.* having the same value, quality, meaning, purpose, etc.
- v.* to cease to exist or be visible
- adj.* hard or firm; characterized by good substantial quality
- n.* the quality of compactness of a substance
- adj.* extremely large or great
- adj.* firm and steady; not easily moved, disturbed, or changed
- n.* a subatomic particle that has the same mass and opposite charge as its corresponding particle (e.g., a positron is the antiparticle of an electron)
- n.* having the same value, quality, meaning, purpose, etc.
- n.* either of two children born at the same time from the same mother
- n.* the number 1,000,000,000,000; a million million
- adj.* capable of being seen; or open to easy view

ANSWERS: 20. concentration, 21. universe, 22. equivalent, 23. disappear, 24. solid, 25. density, 26. enormous, 27. stable, 28. antiparticle, 29. equivalent, 30. twin, 31. trillion, 32. visible

33. measure energy in jo__es *n.* the unit of measurement for energy in the International System of Units (SI), equal to the work done by a force of one newton when its point of application moves one meter in the direction of the force
34. vi_____e by X-ray *adj.* capable of being seen; or open to easy view
35. critical m__s *n.* a large amount of a substance with no definite shape or form; a large number of people or things grouped or crowded together
36. de_____yed evidence *v.* to ruin or damage severely or completely; to eradicate or eliminate completely
37. acc_____te a chemical reaction *v.* to make something faster or earlier; to cause to develop or progress more quickly
38. ant_____er production *n.* matter made up of antiparticles, which have the same mass as regular matter but opposite electrical charges
39. have a st___e job *adj.* firm and steady; not easily moved, disturbed, or changed
40. biomass f__l *n.* a substance that is typically burned to generate heat or energy
41. cu_____cy exchange *n.* a system of money in general use in a particular country
42. cou_____rt agreement *n.* a person or thing that corresponds to or has the same function as another person or thing

ANSWERS: 33. joule, 34. visible, 35. mass, 36. destroy, 37. accelerate, 38. antimatter, 39. stable, 40. fuel, 41. currency, 42. counterpart

43. brilliant fl__h *n.* a sudden intense burst of radiant energy; a momentary brightness
44. b__g his fist on a desk *v.* to hit or cause to hit something in a way that makes a loud noise
45. meet with opp_____on *n.* the act of disagreeing or resisting; the state of strong disagreement
46. g__m amount *n.* a metric unit of weight equal to one-thousandth of a kilogram
47. my_____y novel *n.* something difficult to understand or explain; a secret or enigmatic quality that adds to the fascination or interest of something; a genre of fiction that involves the solution of a crime or a puzzle
48. flow of el_____ons *n.* a tiny particle with the negative electrical charge
49. get in_____t access *adj.* happening immediately, with no delay
50. a we__d dress *adj.* extraordinary, unexpected, or difficult to explain
51. en_____us amount *adj.* extremely large or great
52. series of exp_____nts *n.* the scientific test conducted to observe what happens and gain new knowledge
53. a binomial fo_____a *n.* a group of symbols, letters, or numbers that represent a rule, law, or mathematical statement
54. without impact wha_____er *adv.* not at all; no matter what
55. horseback t__k *n.* a long and difficult journey, typically on foot

ANSWERS: 43. flash, 44. bang, 45. opposition, 46. gram, 47. mystery, 48. electron, 49. instant, 50. weird, 51. enormous, 52. experiment, 53. formula, 54. whatsoever, 55. trek

56. a ma__c spell *n.* beliefs and actions employed to influence supernatural beings and forces; any art or performance that invokes supernatural powers
57. a con_____nal style *adj.* based on or following traditional rules, standards, customs, etc.
58. ant_____cle physics *n.* a subatomic particle that has the same mass and opposite charge as its corresponding particle (e.g., a positron is the antiparticle of an electron)
59. po_____on annihilation *n.* an antiparticle of the electron with a positive charge that has the same mass as the electron but an opposite charge
60. co_____on detection *n.* an instance of two or more objects or entities crashing into each other, usually resulting in damage, impact, or conflict
61. estimate pr_____e costs *adj.* sharply exact or accurate or delimited
62. stuff of science fi_____n *n.* the type of book or story, especially novels, that describes imaginary events and people; anything made up or imagined that is not true
63. digital cu_____cy *n.* a system of money in general use in a particular country
64. at___c nucleus *adj.* of or relating to atom (= the smallest component of an element)
65. wha_____er it be *adv.* not at all; no matter what
66. space sh_____e *n.* a vehicle or boat that regularly moves between two places; bobbin that passes the weft thread between the warp threads

ANSWERS: 56. magic, 57. conventional, 58. antiparticle, 59. positron, 60. collision, 61. precise, 62. fiction, 63. currency, 64. atomic, 65. whatsoever, 66. shuttle

67. so__d employment measures *adj.* hard or firm; characterized by good substantial quality
68. ma___e statues *n.* a hard crystalline metamorphic rock that has a pattern of lines going through it and takes a high polish used for sculpture and as building material; a small ball made of stone, especially one used in children's games
69. co____e chemically with another substance *v.* to join or merge to form a single thing or group
70. smokeless f__l *n.* a substance that is typically burned to generate heat or energy
71. ant_____er propulsion *n.* matter made up of antiparticles, which have the same mass as regular matter but opposite electrical charges
72. ob____e a tradition *v.* to watch or notice something carefully, often to gather information or insights; to take note of something or someone; to celebrate or commemorate a special event or occasion
73. get a con_____nal loan *adj.* based on or following traditional rules, standards, customs, etc.
74. tr_____on cubic feet *n.* the number 1,000,000,000,000; a million million
75. structural fo____a *n.* a group of symbols, letters, or numbers that represent a rule, law, or mathematical statement
76. t__k expedition *n.* a long and difficult journey, typically on foot

ANSWERS: 67. solid, 68. marble, 69. combine, 70. fuel, 71. antimatter, 72. observe, 73. conventional, 74. trillion, 75. formula, 76. trek

77. ex_____ge a few friendly words *v.* to give something and receive something else in return, often with the implication that the items being traded are of equal or comparable value; (noun) the act of giving or taking something in return for something else; a place or system where goods or services can be bought, sold, or traded
78. theory of the un_____se *n.* everything that exists, especially all physical matter, including planets, stars, galaxies, and all other forms of matter and energy
79. reap a ha_____t *n.* yields of plants in a single growing season; the period of the year when gathering occurs on a farm
80. charged pa_____le *n.* a small piece of something; a word or piece of a term with grammatical function but little or no significance
81. a ne_____ve number *adj.* having the quality of something bad or harmful; expressing refusal
82. beam of el_____ons *n.* a tiny particle with the negative electrical charge
83. tr_____rm an education system *v.* to change in outward structure or looks;
84. cross-co____n marriage *n.* the child of your aunt or uncle
85. at____c bomb *adj.* of or relating to atom (= the smallest component of an element)
86. population de_____y *n.* the quality of compactness of a substance

ANSWERS: 77. exchange, 78. universe, 79. harvest, 80. particle, 81. negative, 82. electron, 83. transform, 84. cousin, 85. atomic, 86. density

87. mys_____us stranger *adj.* difficult to understand, explain, or identify; having an aura of secrecy, intrigue, or puzzlement
88. mys_____us object *adj.* difficult to understand, explain, or identify; having an aura of secrecy, intrigue, or puzzlement
89. a planetary or__t *n.* the path of an object around a celestial body, especially a planet, star, or moon, under the influence of gravity; (of medicine) the bony cavity in the skull that houses the eyeball and its associated structures, like muscles, nerves, and blood vessels
90. pair of id_____al twins *adj.* being the exact same one
91. pa_____le energy *n.* a small piece of something; a word or piece of a term with grammatical function but little or no significance
92. asy_____ic information *adj.* lacking symmetry or balance; not corresponding in size, shape, or degree; characterized by an uneven or unequal distribution or arrangement
93. have a ne_____ve effect *adj.* having the quality of something bad or harmful; expressing refusal
94. di_____ar without a trace *v.* to cease to exist or be visible
95. negotiating cou_____rt *n.* a person or thing that corresponds to or has the same function as another person or thing
96. ex_____ge rate *v.* to give something and receive something else in return, often with the implication that the items being traded are of equal or comparable value; (noun) the act of giving or taking something in return for something else; a place or system where goods or services can be bought, sold, or traded

ANSWERS: 87. mysterious, 88. mysterious, 89. orbit, 90. identical, 91. particle, 92.

asymmetric, 93. negative, 94. disappear, 95. counterpart, 96. exchange

97. de____y the ecosystem *v.* to ruin or damage severely or completely; to eradicate or eliminate completely
98. a scanty ha____t *n.* yields of plants in a single growing season; the period of the year when gathering occurs on a farm
99. po____on emission *n.* an antiparticle of the electron with a positive charge that has the same mass as the electron but an opposite charge
100. co____e in midair *v.* to hit something violently when moving
101. opp____on campaign *n.* the act of disagreeing or resisting; the state of strong disagreement
102. non-fi____n bestseller *n.* the type of book or story, especially novels, that describes imaginary events and people; anything made up or imagined that is not true
103. fire st__k *v.* to put something, usually a sharp object, into something; to restrict yourself to doing or using one certain thing and not change; (noun) a thin piece of wood or other material
104. pr____e analyses *adj.* sharply exact or accurate or delimited
105. atomic b__bs *n.* a weapon that explodes and is used to kill or injure people or to cause damage to something
106. a fl__h of lightning *n.* a sudden intense burst of radiant energy; a momentary brightness
107. an in____l letter *adj.* of or happening at the beginning; (noun) the first letter of a word, especially a person's name

ANSWERS: 97. destroy, 98. harvest, 99. positron, 100. collide, 101. opposition, 102. fiction, 103. stick, 104. precise, 105. bomb, 106. flash, 107. initial

108. co_____ed of the idea *adj.* completely certain about something; having a strong belief or conviction in a particular religion
109. artificial ma____e *n.* a hard crystalline metamorphic rock that has a pattern of lines going through it and takes a high polish used for sculpture and as building material; a small ball made of stone, especially one used in children's games
110. a t__n-lens camera *n.* either of two children born at the same time from the same mother
111. con_____ion of armaments *n.* the ability to focus all your time and energy on one thing without thinking about anything else.
112. the or__t of the moon *n.* the path of an object around a celestial body, especially a planet, star, or moon, under the influence of gravity; (of medicine) the bony cavity in the skull that houses the eyeball and its associated structures, like muscles, nerves, and blood vessels
113. laws of ph____s *n.* the science of matter and energy and their interactions
114. alien sp_____ip *n.* (especially in science fiction) a spacecraft designed to carry a crew into interstellar space
115. b__g a phone down *v.* to hit or cause to hit something in a way that makes a loud noise
116. an in____t reply *adj.* happening immediately, with no delay

ANSWERS: 108. convinced, 109. marble, 110. twin, 111. concentration, 112. orbit, 113. physics, 114. spaceship, 115. bang, 116. instant

117. co_____e augmented reality *v.* to join or merge to form a single thing or group
118. internal com_____on engine *n.* the act or process of burning something
119. ha_____s a horse to a carriage *v.* to control and exploit the power of something, especially natural resources that produce energy; (noun) a set of narrow pieces of leather and metal that are used to control or hold in place a person, animal, or object
120. an id_____al equation *adj.* being the exact same one
121. disarm the b__b *n.* a weapon that explodes and is used to kill or injure people or to cause damage to something
122. come into co_____on with my friend *n.* an instance of two or more objects or entities crashing into each other, usually resulting in damage, impact, or conflict
123. unsolved my_____y *n.* something difficult to understand or explain; a secret or enigmatic quality that adds to the fascination or interest of something; a genre of fiction that involves the solution of a crime or a puzzle
124. electromagnetic ra_____on *n.* the energy that comes from a nuclear reaction in the form of rays, waves, or particles and that can be hazardous to health
125. obs_____on instrument *n.* the act or activity of carefully examining or monitoring something or someone
126. in_____l velocity *adj.* of or happening at the beginning; (noun) the first letter of a word, especially a person's name

ANSWERS: 117. combine, 118. combustion, 119. harness, 120. identical, 121. bomb, 122. collision, 123. mystery, 124. radiation, 125. observation, 126. initial

127. save the pl___t *n.* any of the nine large celestial bodies that circle in the solar system; any celestial body that revolves around a star
128. app_____ly unrelated *adv.* based on what you have heard or read
129. put a ha_____s on my pet *v.* to control and exploit the power of something, especially natural resources that produce energy; (noun) a set of narrow pieces of leather and metal that are used to control or hold in place a person, animal, or object
130. pl___t like the Earth *n.* any of the nine large celestial bodies that circle in the solar system; any celestial body that revolves around a star
131. a sp_____ip to survey the moon *n.* (especially in science fiction) a spacecraft designed to carry a crew into interstellar space
132. a m__s of molten rock *n.* a large amount of a substance with no definite shape or form; a large number of people or things grouped or crowded together
133. exposure to ra_____on *n.* the energy that comes from a nuclear reaction in the form of rays, waves, or particles and that can be hazardous to health
134. nuclear ph_____s *n.* the science of matter and energy and their interactions

ANSWERS: 127. planet, 128. apparently, 129. harness, 130. planet, 131. spaceship, 132. mass, 133. radiation, 134. physics

Session 3: Fill in the Blanks

1. How much is it per one hundred _____
n. a metric unit of weight equal to one-thousandth of a kilogram
2. We can calculate the position of the _____ statistically.
n. a small piece of something; a word or piece of a term with grammatical function but little or no significance
3. My father's death _____ my life completely.
v. to change in outward structure or looks;
4. My sister and I frequently _____ books, as we love reading.
v. to give something and receive something else in return, often with the implication that the items being traded are of equal or comparable value; (noun) the act of giving or taking something in return for something else; a place or system where goods or services can be bought, sold, or traded
5. The rocket engine is used to put the satellite into _____.
n. the path of an object around a celestial body, especially a planet, star, or moon, under the influence of gravity; (of medicine) the bony cavity in the skull that houses the eyeball and its associated structures, like muscles, nerves, and blood vessels
6. The building was _____ in the fire and had to be rebuilt.
v. to ruin or damage severely or completely; to eradicate or eliminate completely
7. The _____ is about 13.8 billion years old.
n. everything that exists, especially all physical matter, including planets, stars, galaxies, and all other forms of matter and energy

ANSWERS: 1. grams?, 2. particles, 3. transformed, 4. exchange, 5. orbit, 6. destroyed, 7. universe

8. The _____ of water is called ice.

adj. hard or firm; characterized by good substantial quality

9. The _____ party strongly disagreed with the government's proposed legislation.

n. the act of disagreeing or resisting; the state of strong disagreement

10. The solar wind is composed almost entirely of electrons and _____.

n. a very small particle with a positive charge equal to the negative charge of an electron that forms part of the nucleus of all atoms

11. Infant formulas are nutritionally almost _____ to a mother's breast milk.

adj. being the exact same one

12. His pleasant face turned cold in an _____.

adj. happening immediately, with no delay

13. They watched the train _____ into the distance.

v. to cease to exist or be visible

14. He performed _____ tricks with sophisticated moves.

n. beliefs and actions employed to influence supernatural beings and forces; any art or performance that invokes supernatural powers

15. He was preparing for a long _____ through the mountains.

n. a long and difficult journey, typically on foot

16. The _____ used in this country is the Euro.

n. a system of money in general use in a particular country

ANSWERS: 8. solid-state, 9. opposition, 10. protons, 11. identical, 12. instant, 13. disappear, 14. magic, 15. trek, 16. currency

17. Mercury is the closest _____ to the sun.

n. any of the nine large celestial bodies that circle in the solar system; any celestial body that revolves around a star

18. Relations between the two countries have been relatively _____ due to the summit meeting.

adj. firm and steady; not easily moved, disturbed, or changed

19. Do you know the _____ of the population in Hong Kong?

n. the quality of compactness of a substance

20. Truth is stranger than _____.

n. the type of book or story, especially novels, that describes imaginary events and people; anything made up or imagined that is not true

21. The outermost _____ shell determines the chemical properties of an atom.

n. a tiny particle with the negative electrical charge

22. He refused to do anything _____ to help her.

adv. not at all; no matter what

23. The _____ design of the building made it stand out in the city skyline.

adj. lacking symmetry or balance; not corresponding in size, shape, or degree; characterized by an uneven or unequal distribution or arrangement

24. Carbon has an _____ mass of 12.

adj. of or relating to atom (= the smallest component of an element)

25. The _____ bus will take you to the airport in 15 minutes.

n. a vehicle or boat that regularly moves between two places; bobbin that passes the weft thread between the warp threads

ANSWERS: 17. planet, 18. stable, 19. density, 20. fiction, 21. electron, 22. whatsoever, 23. asymmetric, 24. atomic, 25. shuttle

26. During _____ farmers are incredibly busy.
- n.* yields of plants in a single growing season; the period of the year when gathering occurs on a farm
27. The _____ scarcity most severely impacted the manufacturing sector
- n.* a substance that is typically burned to generate heat or energy
28. They launched a crewless _____ into space.
- n.* (especially in science fiction) a spacecraft designed to carry a crew into interstellar space
29. The _____ of people who do not own property is politically impotent.
- n.* a large amount of a substance with no definite shape or form; a large number of people or things grouped or crowded together
30. Shakespeare's output of poetry was _____.
- adj.* extremely large or great
31. He tried every possible treatment, including chemotherapy and _____ therapy.
- n.* the energy that comes from a nuclear reaction in the form of rays, waves, or particles and that can be hazardous to health
32. Scientists are studying the properties of _____ to gain a deeper understanding of the universe.
- n.* matter made up of antiparticles, which have the same mass as regular matter but opposite electrical charges
33. People have been exploring ways to _____ natural forces and resources since ancient times.
- v.* to control and exploit the power of something, especially natural resources that produce energy; (noun) a set of narrow pieces of leather and metal that are used to control or hold in place a person, animal, or object

ANSWERS: 26. harvest, 27. fuel, 28. spaceship, 29. mass, 30. enormous, 31. radiation, 32. antimatter, 33. harness

34. This exam requires excellent _____ to pass.

n. the ability to focus all your time and energy on one thing without thinking about anything else.

35. One light year is nearly 6 _____ miles.

n. the number 1,000,000,000,000; a million million

36. A 60-watt light bulb uses 60 _____ of energy per second.

n. the unit of measurement for energy in the International System of Units (SI), equal to the work done by a force of one newton when its point of application moves one meter in the direction of the force

37. The public is _____ that the prime minister has committed fraud.

adj. completely certain about something; having a strong belief or conviction in a particular religion

38. The _____ disappearance of the ship remains unsolved.

adj. difficult to understand, explain, or identify; having an aura of secrecy, intrigue, or puzzlement

39. The teacher told the students to memorize the math _____.

n. a group of symbols, letters, or numbers that represent a rule, law, or mathematical statement

40. _____ of the people grew until the revolt was unavoidable.

n. the act or process of burning something

41. These heavy rains caused _____ floods on several islands.

n. a sudden intense burst of radiant energy; a momentary brightness

ANSWERS: 34. concentration, 35. trillion, 36. joules, 37. convinced, 38. mysterious, 39. formula, 40. Combustion, 41. flash

42. When an _____ meets its corresponding particle, the two annihilate.
n. a subatomic particle that has the same mass and opposite charge as its corresponding particle (e.g., a positron is the antiparticle of an electron)
43. The movie has received almost universally _____ criticism.
adj. having the quality of something bad or harmful; expressing refusal
44. The government tried to _____ the commercialization of this development.
v. to make something faster or earlier; to cause to develop or progress more quickly
45. It is important to _____ safety procedures in the workplace to prevent accidents.
v. to watch or notice something carefully, often to gather information or insights; to take note of something or someone; to celebrate or commemorate a special event or occasion
46. My home is easily _____ from the shore.
adj. capable of being seen; or open to easy view
47. Its _____ brothers are difficult to tell apart except for their parents.
n. either of two children born at the same time from the same mother
48. They took the _____ step toward reconciliation.
adj. of or happening at the beginning; (noun) the first letter of a word, especially a person's name
49. You _____ a bill in the change machine, and the coins pop out.
v. to put something, usually a sharp object, into something; to restrict yourself to doing or using one certain thing and not change; (noun) a thin piece of wood or other material

ANSWERS: 42. antiparticle, 43. negative, 44. accelerate, 45. observe, 46. visible, 47. twin, 48. initial, 49. stick

50. In the hospital, she will remain under constant _____.

n. the act or activity of carefully examining or monitoring something or someone

51. The police _____ believed this explanation was plausible.

adv. based on what you have heard or read

52. The European Central Bank is Europe's _____ of the Federal Reserve.

n. having the same value, quality, meaning, purpose, etc.

53. _____ emission tomography, or PET, is a medical imaging technique.

n. an antiparticle of the electron with a positive charge that has the same mass as the electron but an opposite charge

54. The content is _____ and informative for me.

adj. sharply exact or accurate or delimited

55. The floor was made of white and black _____ arranged in a checkerboard pattern.

n. a hard crystalline metamorphic rock that has a pattern of lines going through it and takes a high polish used for sculpture and as building material; a small ball made of stone, especially one used in children's games

56. His _____ in the other company is responsible for marketing.

n. a person or thing that corresponds to or has the same function as another person or thing

57. My computer has been acting _____ recently.

adj. extraordinary, unexpected, or difficult to explain

ANSWERS: 50. observation, 51. apparently, 52. equivalent, 53. Positron, 54. precise, 55. marble, 56. counterpart, 57. weird

58. I used to play with my younger male _____ when I was a little girl.
n. the child of your aunt or uncle
59. My father tried to _____ mathematics into my head since childhood.
v. to hit or cause to hit something in a way that makes a loud noise
60. The _____ surrounding the disappearance of the traveler has yet to be solved by authorities.
n. something difficult to understand or explain; a secret or enigmatic quality that adds to the fascination or interest of something; a genre of fiction that involves the solution of a crime or a puzzle
61. He studied the _____ of radiation.
n. the science of matter and energy and their interactions
62. The use of cluster _____ is strictly prohibited by international law.
n. a weapon that explodes and is used to kill or injure people or to cause damage to something
63. Hydrogen and oxygen _____ to form water.
v. to join or merge to form a single thing or group
64. The _____ of tectonic plates can result in new mountain ranges, such as the Himalayas or the Alps.
n. an instance of two or more objects or entities crashing into each other, usually resulting in damage, impact, or conflict
65. She is very _____ in her thoughts.
adj. based on or following traditional rules, standards, customs, etc.

ANSWERS: 58. cousins, 59. bang, 60. mystery, 61. physics, 62. bombs, 63. combine, 64. collision, 65. conventional

66. His _____ showed highly positive results.

n. the scientific test conducted to observe what happens and gain new knowledge

67. The interests of the two countries _____.

v. to hit something violently when moving

ANSWERS: 66. experiments, 67. collide