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Vocabulary Builder Reference from...

Fan Zhang: What in the world is topological quantum matter? | TED Talk

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

All Words

IMPORTANT

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Session 1: Word List

electrify

v. to make a machine or system work by using electricity; to make someone extremely enthusiastic about or interested in something

synonym: wire, amaze, astonish

(1) **electrify** the audience, (2) **electrify** a manufacturing process

The product developed through years of research continues to **electrify** the market.

diminish

v. to reduce or be reduced in size, extent, or importance; to make something smaller, weaker, etc.

synonym: decline, dwindle, lessen

(1) **diminish** a reputation, (2) **diminish** swelling

As people get old, their energies may **diminish**.

exponential

adj. becoming more and more rapid; of or involving mathematical exponents

(1) **exponential** growth, (2) **exponential** function

Since the 1990s, the Internet has continued to experience **exponential** growth.

accuracy

n. the state or degree of being exact or correct; the ability to perform something with proficiency and without

mistake

synonym: precision, exactness, truthfulness

(1) degree of **accuracy**, (2) the **accuracy** of his compass
To assure **accuracy**, I recommend investing in high-quality test kits.

physics

n. the science of matter and energy and their interactions

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

He studied the **physics** of radiation.

award

n. a prize or other mark of recognition given in honor of an achievement

synonym: prize, honor, accolade

(1) **award** ceremony, (2) participation **award**

He won the **award** for best actor at the film festival.

discovery

n. the act or process of finding information, a place, or an object, or learning about something that was previously not known

synonym: finding, uncovering, detection

(1) a scientific **discovery**, (2) the great **discovery** of the century

Her research team made an important **discovery**.

microscopic

adj. tiny; exceedingly precise and detail-oriented; of or used in microscopy

synonym: infinitesimal, tiny, atomic

(1) **microscopic** inquiry, (2) **microscopic** analysis

Inspectors noticed **microscopic** cracks in the submarine's hull.

exhibit

v. to show something in public for people to enjoy or to provide them with information

synonym: display, expose, show

(1) **exhibit** a bad attitude, (2) **exhibit** a great talent

Other technology industries **exhibit** similarly explosive

growth.

macroscopic

adj. visible to the naked eye; relating to objects or phenomena that are large enough to be seen without the aid of a microscope or other magnifying tools

synonym : large, visible, apparent

(1) **macroscopic** observation, (2) **macroscopic** anatomy
The **macroscopic** view of the galaxy is simply breathtaking.

phase

n. any stage in a series of events, change, or development

synonym : degree, stage, step

(1) enter on the last **phase**, (2) two- **phase** structure

The era of the industrial revolution was a crucial **phase** of history.

topology

n. a branch of mathematics that deals with the properties of space that are preserved under continuous transformations, such as stretching, bending, and twisting, without tearing or gluing

synonym : geometric study, mathematical analysis

(1) mathematical **topology**, (2) **topology** diagram

The mathematician studied the **topology** of different shapes and spaces.

branch

n. a division of a tree or woody shrub that grows out from the trunk or a main stem; a division of some larger or more complex organization

synonym : limb, twig, bough

(1) **branch** office, (2) a **branch** pipe

The **branch** of the tree had fallen and blocked the road.

mathematics

n. the science dealing with the logic of quantities, shapes, spaces, and arrangement

synonym : arithmetic, calculation, calculus

(1) a good grounding in **mathematics**, (2) **mathematics** competition

He has a flair for **mathematics**.

fundamental

adj. forming an essential base or core from which everything else develops or is affected

synonym: basic, essential, entire

(1) **fundamental** education, (2) **fundamental** rights

Human behavior has **fundamental** characteristics.

gradual

adj. happening slowly over a long period of time or distance; not steep or abrupt

synonym: incremental, gradational, piecemeal

(1) a **gradual** process, (2) a **gradual** change

The country experienced a **gradual** increase in population.

stretch

v. to make or be capable of making anything longer or broader without hurting or breaking

synonym: lengthen, prolong, extend

(1) **stretch** along the coast, (2) **stretch** a story

Some herds have been observed to **stretch** hundreds of kilometers.

attach

v. to fasten, join, or connect one thing to another

synonym: fix, fasten, bind

(1) **attach** firmly, (2) **attach** a file to an e-mail

He does not **attach** importance to these rumors.

dough

n. a mixture of flour, liquid, and other ingredients, typically used to make bread, pastry, or pasta

synonym: flour, mix

(1) work **dough**, (2) **dough** for pastry

She mixed flour, yeast, sugar, and water to make **dough** for the bread.

reshape

v. to change the form or structure of something

synonym: alter, adjust, modify

(1) **reshape** education policy, (2) **reshape** my thoughts

The advent of the Internet completely **reshaped** the manufacturing industry.

property

n. a thing or things that belong to someone

synonym: belongings, possessions, equity

(1) a man of **property**, (2) chemical **property**

He stood to inherit a million-dollar **property**.

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.

pretzel

n. a type of baked bread product that is twisted into a knot-like shape, usually sprinkled with salt, and often served as a snack or appetizer

(1) chocolate **pretzel**, (2) **pretzel** stand

I love snacking on **pretzels** while watching a movie at home.

increment

n. a regular increase in the amount of something, such as money; a process of becoming larger, longer, or more important

synonym: increase, expansion, addendum

(1) steady **incremental** growth, (2) small **increments**

The bid **increment** for this auction is \$100.

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.

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.

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.

photon

n. a unit or quantum of electromagnetic energy, typically regarded as a particle that is the basic constituent of all light and other forms of electromagnetic radiation

synonym : particle, quantum, light

(1) **photon** emission, (2) **photon** energy

Infrared cameras detect **photons** in the infrared range of the electromagnetic spectrum.

quantum

n. the smallest amount or unit of something, especially (electromagnetic) energy

(1) probabilistic **quantum** theory, (2) laws of **quantum** mechanics

Big techs are now eager to develop **quantum** computers.

involve

v. to include or affect someone or something as a necessary part of something else

synonym : implicate, include, engage

(1) **involve** a lot of paperwork, (2) **involve** a high degree of risk

The investigation **involves** several government agencies and is expected to take several months.

uncertain

adj. not being sure of something; not being able to choose

synonym : doubtful, skeptical, pending

(1) numerous **uncertain** factors, (2) take an **uncertain** attitude

She was **uncertain** about her friend's intentions.

revolutionize

v. to bring about a complete or radical change in something, often through the introduction of new methods or ideas

synonym: transform, innovate, modernize

(1) **revolutionize** the industry, (2) **revolutionize** the technology

The invention of the smartphone **revolutionized** the way we communicate with each other.

electronics

n. the branch of physics and technology that deals with the behavior and control of electrons and the use of electronic devices and systems

synonym: technology, gadgets, circuitry

(1) **electronics** industry, (2) **electronics** store

The company specializes in manufacturing and selling cutting-edge **electronics**.

engineer

n. a person whose job is designing, building, or maintaining something such as machines, structures, or software

synonym: architect, creator, builder

(1) a civil **engineer**, (2) **engineer** shortage

The **engineer** will repair my telephone tomorrow morning.

stability

n. the quality or attribute of being firm and steadfast

synonym: resilience, solidity, steadiness

(1) **stability** pact, (2) fiscal **stability** pact

The policy should increase the country's monetary **stability**.

remarkable

adj. worthy of attention because unusual or special

synonym: outstanding, exceptional, extraordinary

(1) **remarkable** achievement, (2) the **remarkable** breadth of knowledge

The election was a **remarkable** success for the Whigs.

characteristic

n. a typical feature or quality that can identify, tell apart, or describe something or somebody

synonym: feature, quality, attribute

(1) stripes **characteristic** of the zebra, (2) my friend's **characteristic** laugh

Bananas have their **characteristic** taste and odor.

exotic

adj. originating from or characteristic of a foreign country or culture; strikingly unusual, uncommon, or intriguing

synonym: foreign, alien, unfamiliar

(1) **exotic** species, (2) **exotic** vacation

I love trying **exotic** foods from different cultures.

delicate

adj. very fine, subtle, and pleasing; easily broken or damaged or destroyed

synonym: dainty, exquisite, fragile

(1) **delicate** attention, (2) a **delicate** flavor

The fresh green trees cast a **delicate** web of shadows over the lawn.

insulate

v. to protect something by interposing material that prevents heat, noise, electricity, etc.

synonym: isolate, protect, seclude

(1) **insulate** the room from sound, (2) **insulate** electricity

We had our bedroom **insulated** before winter came.

magnetic

adj. having the properties of attracting or repelling certain materials containing iron or steel

synonym: attractive, drawing, hypnotic

(1) **magnetic** field, (2) a **magnetic** tape

The **magnetic** force of the earth keeps our planet spinning.

passee

adj. no longer fashionable or current; outdated; considered to be old-fashioned or out of date

synonym: outdated, old-fashioned, antique

(1) **passee** entertainment, (2) **passee** trend

Bell-bottom jeans, once considered **passee** fashion, have made a surprising comeback in recent years.

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**.

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.

loop

n. a shape like a curve or a circle made by something long and thin, such as a piece of string, that bends round and crosses itself

synonym : circle, curl, spiral

(1) exit from a **loop**, (2) positive feedback **loop**

Many people in this city use the **loop** railway for transportation.

conduct

v. to organize and carry out a particular activity

synonym : behave, lead, carry on

(1) **conduct** a background check, (2) **conduct** research

Police will **conduct** random breath testing for drunk driving.

conductivity

n. the quality of a material's ability to conduct electricity, heat, etc.

synonym : conduction

(1) low **conductivity**, (2) electrical **conductivity**

High thermal **conductivity** is also essential for the exterior of the machine.

affected

adj. influenced; feeling or showing emotion, especially exaggerated emotion; not natural or sincere

synonym : artificial, pretentious, stilted

(1) **affected** way of walking, (2) the **affected** part

Her **affected** accent made it difficult to take her seriously.

impure

adj. mixed with other substances or foreign matter; (of persons or behaviors) immoral or obscene, especially in sexual matters

synonym : contaminated, polluted, unclean

(1) **impure** water, (2) **impure** thoughts

In some religions, pork is deemed **impure**.

imperfectly

adv. in a faulty or incomplete way

synonym : amiss, insufficiently, clumsily

(1) **imperfectly** developed, (2) **imperfectly** known disease

He created an **imperfectly** shaped torso.

transport

n. a system for moving people or products from one location to another using automobiles, roads, and so on

synonym : shipment, transit, conveyance

(1) **transport** facilities, (2) access to public **transport**

Enhanced rail **transportation** is crucial for our business.

backward

adv. at, to, or toward the direction or place that is behind or rear

synonym : back, rearward, in reverse

(1) walk **backward**, (2) **backward** angle

She falls over **backward** when she sees her mother-in-law.

pathway

n. a track that constitutes or serves as a path; an approach or a way of doing something

synonym : route, footpath, trail

(1) **pathway** to understanding, (2) cellular signaling

pathways

When the first molecule in the **pathway** receives a signal, it activates other molecules.

efficient

adj. performing at the highest level of productivity with the least wasted effort or resources; capable of achieving maximum output with minimum wasted effort, time, or materials

synonym: productive, effective, competent

(1) **efficient** operation, (2) energy- **efficient** appliances

The new washing machine is much more **efficient** than the old one.

highway

n. a main road, especially one connecting major towns or cities

synonym: road, expressway, freeway

(1) **highway** system, (2) an interstate **highway**

I'm going to take the **highway** to get to my destination faster.

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.

compute

v. to make a mathematical calculation

synonym: calculate

(1) **compute** an average score, (2) **compute** the value

I tried to **compute** the efficiency of the investment.

advantage

n. a condition or circumstance that puts one in a favorable or superior position; a beneficial feature or asset that someone or something has

synonym: benefit, edge, asset

(1) score an **advantage**, (2) take **advantage** of his weak points

One of the main **advantages** of the new product is its increased efficiency.

statistics

n. the discipline that concerns the collection, organization, analysis, interpretation, and presentation of data

(1) **statistics** for cancer, (2) official **statistics**

The **statistics** demonstrate that poverty and unemployment are genuine problems.

qubit

n. a unit of information used in quantum computing, equivalent to a single binary digit (or "bit") of classical computing, which can exist in multiple possible states simultaneously, offering greater information processing potential than classical bits

synonym : quantum bit

(1) quantum **qubit**, (2) **qubit** storage

Technology development for controlling **qubits** is a major research goal in quantum computing.

classic

adj. judged or deserving to be regarded as one of the best or most important of its kind over a period of time; of a well-known type

synonym : definitive, traditional, typical

(1) a **classic** experiment, (2) Chinese **classic** literature

He displayed the **classic** symptoms of depression.

digital

adj. processing or storing information as a succession of 1 and 0 to show that a signal is present or missing; relating to the use of computer technology, especially the internet

synonym : numerical, computerized, cyber

(1) a **digital** watch, (2) **digital** electronic signature

Sensors convert physical phenomena into **digital** signals.

interaction

n. the act of connecting with someone, mainly when working, playing, or spending time with them

synonym : dealings, exchange, relations

(1) the **interaction** between man and his environment,

(2) **interaction** among human beings

The **interaction** of the two groups is good for brainstorming.

environment

n. the natural world such as air, water, and land in which humans, animals, and plants live

synonym: atmosphere, surroundings, climate

(1) **environment** affairs, (2) chaotic **environment**

Every human is responsible for taking care of the Earth's **environment**.

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.

disturbance

n. something that interrupts a settled and peaceful condition or that makes someone feel nervous or worried

synonym: disorder, upset, annoyance

(1) a nervous **disturbance**, (2) a **disturbance** caused by a terrorist

This building construction causes serious **disturbance** to residents.

accurate

adj. correct and exact in all details

synonym: exact, precise, proper

(1) provide **accurate** information, (2) **accurate** measurements

The official transcript contains **accurate** academic records.

computation

n. the act or process of calculating something, especially an answer or amount, by using a machine or calculator

synonym: calculation, estimation, arithmetic

(1) parallel **computation**, (2) theory of **computation**

The researcher demonstrated the superiority of quantum **computation** in several mathematical tasks.

origin

n. the first existence or beginning of something

synonym: root, source, ancestor

(1) **origin** of information, (2) racial **origin**

There are various hypotheses concerning the **origin** of life.

studied

adj. deliberately considered or scrutinized; carefully thought out or planned

synonym: thoughtful, deliberate, calculated

(1) **studied** analysis, (2) well- **studied** decision

His speech was carefully crafted and delivered with **studied** confidence.

purity

n. the state of being undiluted or unmixed with anything else; the state of being free from immorality, especially of a sexual nature

synonym: sinlessness, innocence, cleanliness

(1) the degree of **purity**, (2) high **purity**

Higher **purity** requires additional equipment and energy.

abstract

adj. based on general ideas, feelings, or qualities and not on any a physical or concrete existence

synonym: conceptual, theoretical, ideational

(1) an **abstract** noun, (2) **abstract** science

The invention of the camera triggered the development of **abstract** painting.

pioneering

adj. involving new ideas or methods; being the first of their kind; leading the way in a particular field

synonym: innovative, groundbreaking, trailblazing

(1) **pioneering** research, (2) **pioneering** spirit

The **pioneering** scientist developed a breakthrough technology that revolutionized the industry.

riddle

n. a type of question that describes something in a difficult and confusing way, and that has a surprising answer, often asked as a game

synonym: mystery, puzzle, enigma

(1) **riddle** me a riddle, (2) solve the **riddle**

The **riddle** remains mysterious to us.

Session 2: Spelling

1. energy-ef_____nt appliances *adj.* performing at the highest level of productivity with the least wasted effort or resources; capable of achieving maximum output with minimum wasted effort, time, or materials
2. ex_____t a bad attitude *v.* to show something in public for people to enjoy or to provide them with information
3. positive feedback l__p *n.* a shape like a curve or a circle made by something long and thin, such as a piece of string, that bends round and crosses itself
4. exp_____al growth *adj.* becoming more and more rapid; of or involving mathematical exponents
5. flow of el_____ons *n.* a tiny particle with the negative electrical charge
6. tr_____rm an education system *v.* to change in outward structure or looks;
7. provide ac_____te information *adj.* correct and exact in all details
8. ma_____ic field *adj.* having the properties of attracting or repelling certain materials containing iron or steel
9. ex___c species *adj.* originating from or characteristic of a foreign country or culture; strikingly unusual, uncommon, or intriguing
10. exp_____al function *adj.* becoming more and more rapid; of or involving mathematical exponents

ANSWERS: 1. efficient, 2. exhibit, 3. loop, 4. exponential, 5. electron, 6. transform, 7. accurate, 8. magnetic, 9. exotic, 10. exponential

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|--|---|
| 11. the int_____on between man and his environment | <i>n.</i> the act of connecting with someone, mainly when working, playing, or spending time with them |
| 12. ab_____ct science | <i>adj.</i> based on general ideas, feelings, or qualities and not on any a physical or concrete existence |
| 13. low con_____ity | <i>n.</i> the quality of a material's ability to conduct electricity, heat, etc. |
| 14. the ac_____cy of his compass | <i>n.</i> the state or degree of being exact or correct; the ability to perform something with proficiency and without mistake |
| 15. walk ba_____rd | <i>adv.</i> at, to, or toward the direction or place that is behind or rear |
| 16. solve the ri_____e | <i>n.</i> a type of question that describes something in a difficult and confusing way, and that has a surprising answer, often asked as a game |
| 17. mic_____ic analysis | <i>adj.</i> tiny; exceedingly precise and detail-oriented; of or used in microscopy |
| 18. en_____er shortage | <i>n.</i> a person whose job is designing, building, or maintaining something such as machines, structures, or software |
| 19. re_____e my thoughts | <i>v.</i> to change the form or structure of something |
| 20. theory of com_____on | <i>n.</i> the act or process of calculating something, especially an answer or amount, by using a machine or calculator |
| 21. well-st_____d decision | <i>adj.</i> deliberately considered or scrutinized; carefully thought out or planned |

ANSWERS: 11. interaction, 12. abstract, 13. conductivity, 14. accuracy, 15. backward, 16. riddle, 17. microscopic, 18. engineer, 19. reshape, 20. computation, 21. studied

22. my friend's cha_____tic laugh *n.* a typical feature or quality that can identify, tell apart, or describe something or somebody
23. di_____sh a reputation *v.* to reduce or be reduced in size, extent, or importance; to make something smaller, weaker, etc.
24. in st___e condition *adj.* firm and steady; not easily moved, disturbed, or changed
25. the af_____ed part *adj.* influenced; feeling or showing emotion, especially exaggerated emotion; not natural or sincere
26. a scientific di_____ry *n.* the act or process of finding information, a place, or an object, or learning about something that was previously not known
27. fiscal st_____ty pact *n.* the quality or attribute of being firm and steadfast
28. pa__e entertainment *adj.* no longer fashionable or current; outdated; considered to be old-fashioned or out of date
29. ef_____nt operation *adj.* performing at the highest level of productivity with the least wasted effort or resources; capable of achieving maximum output with minimum wasted effort, time, or materials
30. a civil en_____er *n.* a person whose job is designing, building, or maintaining something such as machines, structures, or software
31. an ab_____ct noun *adj.* based on general ideas, feelings, or qualities and not on any a physical or concrete existence

ANSWERS: 22. characteristic, 23. diminish, 24. stable, 25. affected, 26. discovery, 27. stability, 28. passe, 29. efficient, 30. engineer, 31. abstract

32. charged pa_____le *n.* a small piece of something; a word or piece of a term with grammatical function but little or no significance
33. st_____h a story *v.* to make or be capable of making anything longer or broader without hurting or breaking
34. tr_____rm heat into power *v.* to change in outward structure or looks;
35. tr_____rt facilities *n.* a system for moving people or products from one location to another using automobiles, roads, and so on
36. have a st_____e job *adj.* firm and steady; not easily moved, disturbed, or changed
37. fun_____al education *adj.* forming an essential base or core from which everything else develops or is affected
38. at_____c bomb *adj.* of or relating to atom (= the smallest component of an element)
39. pr_____l stand *n.* a type of baked bread product that is twisted into a knot-like shape, usually sprinkled with salt, and often served as a snack or appetizer
40. 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
41. racial or____n *n.* the first existence or beginning of something
42. st_____ty pact *n.* the quality or attribute of being firm and steadfast

ANSWERS: 32. particle, 33. stretch, 34. transform, 35. transport, 36. stable, 37. fundamental, 38. atomic, 39. pretzel, 40. stick, 41. origin, 42. stability

43. ph___n emission *n.* a unit or quantum of electromagnetic energy, typically regarded as a particle that is the basic constituent of all light and other forms of electromagnetic radiation
44. a de_____te flavor *adj.* very fine, subtle, and pleasing; easily broken or damaged or destroyed
45. el_____fy the audience *v.* to make a machine or system work by using electricity; to make someone extremely enthusiastic about or interested in something
46. fun_____al rights *adj.* forming an essential base or core from which everything else develops or is affected
47. pa_____le energy *n.* a small piece of something; a word or piece of a term with grammatical function but little or no significance
48. aw__d ceremony *n.* a prize or other mark of recognition given in honor of an achievement
49. co_____e an average score *v.* to make a mathematical calculation
50. ele_____cs store *n.* the branch of physics and technology that deals with the behavior and control of electrons and the use of electronic devices and systems
51. high pu___y *n.* the state of being undiluted or unmixed with anything else; the state of being free from immorality, especially of a sexual nature
52. di_____l electronic signature *adj.* processing or storing information as a succession of 1 and 0 to show that a signal is present or missing; relating to the use of computer technology, especially the internet

ANSWERS: 43. photon, 44. delicate, 45. electrify, 46. fundamental, 47. particle, 48. award, 49. compute, 50. electronics, 51. purity, 52. digital

53. at___c nucleus *adj.* of or relating to atom (= the smallest component of an element)
54. at___h firmly *v.* to fasten, join, or connect one thing to another
55. steady in_____ntal growth *n.* a regular increase in the amount of something, such as money; a process of becoming larger, longer, or more important
56. ex_____t a great talent *v.* to show something in public for people to enjoy or to provide them with information
57. rem_____le achievement *adj.* worthy of attention because unusual or special
58. a ma_____ic tape *adj.* having the properties of attracting or repelling certain materials containing iron or steel
59. co_____t research *v.* to organize and carry out a particular activity
60. a dis_____ce caused by a terrorist *n.* something that interrupts a settled and peaceful condition or that makes someone feel nervous or worried
61. el_____fy a manufacturing process *v.* to make a machine or system work by using electricity; to make someone extremely enthusiastic about or interested in something
62. or___n of information *n.* the first existence or beginning of something
63. co_____t a background check *v.* to organize and carry out a particular activity

ANSWERS: 53. atomic, 54. attach, 55. increment, 56. exhibit, 57. remarkable, 58. magnetic, 59. conduct, 60. disturbance, 61. electrify, 62. origin, 63. conduct

64. a nervous dis_____ce *n.* something that interrupts a settled and peaceful condition or that makes someone feel nervous or worried
65. official sta_____cs *n.* the discipline that concerns the collection, organization, analysis, interpretation, and presentation of data
66. ba_____rd angle *adv.* at, to, or toward the direction or place that is behind or rear
67. br____h office *n.* a division of a tree or woody shrub that grows out from the trunk or a main stem; a division of some larger or more complex organization
68. chaotic env_____nt *n.* the natural world such as air, water, and land in which humans, animals, and plants live
69. to_____gy diagram *n.* a branch of mathematics that deals with the properties of space that are preserved under continuous transformations, such as stretching, bending, and twisting, without tearing or gluing
70. a br____h pipe *n.* a division of a tree or woody shrub that grows out from the trunk or a main stem; a division of some larger or more complex organization
71. im____e water *adj.* mixed with other substances or foreign matter; (of persons or behaviors) immoral or obscene, especially in sexual matters
72. probabilistic qu_____m theory *n.* the smallest amount or unit of something, especially (electromagnetic) energy

ANSWERS: 64. disturbance, 65. statistics, 66. backward, 67. branch, 68. environment, 69. topology, 70. branch, 71. impure, 72. quantum

73. int_____on among human beings *n.* the act of connecting with someone, mainly when working, playing, or spending time with them
74. de_____yed evidence *v.* to ruin or damage severely or completely; to eradicate or eliminate completely
75. ri___e me a riddle *n.* a type of question that describes something in a difficult and confusing way, and that has a surprising answer, often asked as a game
76. st_____d analysis *adj.* deliberately considered or scrutinized; carefully thought out or planned
77. a cl_____c experiment *adj.* judged or deserving to be regarded as one of the best or most important of its kind over a period of time; of a well-known type
78. score an ad_____ge *n.* a condition or circumstance that puts one in a favorable or superior position; a beneficial feature or asset that someone or something has
79. exit from a l__p *n.* a shape like a curve or a circle made by something long and thin, such as a piece of string, that bends round and crosses itself
80. de_____y the ecosystem *v.* to ruin or damage severely or completely; to eradicate or eliminate completely
81. in_____te electricity *v.* to protect something by interposing material that prevents heat, noise, electricity, etc.

ANSWERS: 73. interaction, 74. destroy, 75. riddle, 76. studied, 77. classic, 78. advantage, 79. loop, 80. destroy, 81. insulate

82. mac_____ic observation *adj.* visible to the naked eye; relating to objects or phenomena that are large enough to be seen without the aid of a microscope or other magnifying tools
83. 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
84. a di_____l watch *adj.* processing or storing information as a succession of 1 and 0 to show that a signal is present or missing; relating to the use of computer technology, especially the internet
85. laws of qu_____m mechanics *n.* the smallest amount or unit of something, especially (electromagnetic) energy
86. Chinese cl_____c literature *adj.* judged or deserving to be regarded as one of the best or most important of its kind over a period of time; of a well-known type
87. af_____ed way of walking *adj.* influenced; feeling or showing emotion, especially exaggerated emotion; not natural or sincere
88. co_____e the value *v.* to make a mathematical calculation
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

ANSWERS: 82. macroscopic, 83. stick, 84. digital, 85. quantum, 86. classic, 87. affected, 88. compute, 89. orbit

90. imp_____ly developed *adv.* in a faulty or incomplete way
91. de_____te attention *adj.* very fine, subtle, and pleasing; easily broken or damaged or destroyed
92. a good grounding in mat_____cs *n.* the science dealing with the logic of quantities, shapes, spaces, and arrangement
93. a gr_____l process *adj.* happening slowly over a long period of time or distance; not steep or abrupt
94. do__h for pastry *n.* a mixture of flour, liquid, and other ingredients, typically used to make bread, pastry, or pasta
95. access to public tr_____rt *n.* a system for moving people or products from one location to another using automobiles, roads, and so on
96. pa_____y to understanding *n.* a track that constitutes or serves as a path; an approach or a way of doing something
97. take an un_____in attitude *adj.* not being sure of something; not being able to choose
98. hi_____y system *n.* a main road, especially one connecting major towns or cities
99. in_____e a high degree of risk *v.* to include or affect someone or something as a necessary part of something else
100. pio_____ng research *adj.* involving new ideas or methods; being the first of their kind; leading the way in a particular field
101. pa__e trend *adj.* no longer fashionable or current; outdated; considered to be old-fashioned or out of date

ANSWERS: 90. imperfectly, 91. delicate, 92. mathematics, 93. gradual, 94. dough, 95. transport, 96. pathway, 97. uncertain, 98. highway, 99. involve, 100. pioneering, 101. passe

102. cellular signaling pa_____ys *n.* a track that constitutes or serves as a path; an approach or a way of doing something
103. at___h a file to an e-mail *v.* to fasten, join, or connect one thing to another
104. a gr_____l change *adj.* happening slowly over a long period of time or distance; not steep or abrupt
105. mathematical to_____gy *n.* a branch of mathematics that deals with the properties of space that are preserved under continuous transformations, such as stretching, bending, and twisting, without tearing or gluing
106. 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
107. numerous un_____in factors *adj.* not being sure of something; not being able to choose
108. in_____e a lot of paperwork *v.* to include or affect someone or something as a necessary part of something else
109. an interstate hi_____y *n.* a main road, especially one connecting major towns or cities
110. qu__t storage *n.* a unit of information used in quantum computing, equivalent to a single binary digit (or "bit") of classical computing, which can exist in multiple possible states simultaneously, offering greater information processing potential than classical bits

ANSWERS: 102. pathway, 103. attach, 104. gradual, 105. topology, 106. orbit, 107. uncertain, 108. involve, 109. highway, 110. qubit

111. the rem_____le breadth of knowledge
adj. worthy of attention because unusual or special
112. rev_____ize the industry
v. to bring about a complete or radical change in something, often through the introduction of new methods or ideas
113. ac_____te measurements
adj. correct and exact in all details
114. chemical pr_____ty
n. a thing or things that belong to someone
115. electrical con_____ity
n. the quality of a material's ability to conduct electricity, heat, etc.
116. env_____nt affairs
n. the natural world such as air, water, and land in which humans, animals, and plants live
117. ele_____cs industry
n. the branch of physics and technology that deals with the behavior and control of electrons and the use of electronic devices and systems
118. nuclear ph_____s
n. the science of matter and energy and their interactions
119. di_____sh swelling
v. to reduce or be reduced in size, extent, or importance; to make something smaller, weaker, etc.
120. mac_____ic anatomy
adj. visible to the naked eye; relating to objects or phenomena that are large enough to be seen without the aid of a microscope or other magnifying tools
121. re_____e education policy
v. to change the form or structure of something

ANSWERS: 111. remarkable, 112. revolutionize, 113. accurate, 114. property, 115. conductivity, 116. environment, 117. electronics, 118. physics, 119. diminish, 120. macroscopic, 121. reshape

122. rev_____ize the technology *v.* to bring about a complete or radical change in something, often through the introduction of new methods or ideas
123. sta_____cs for cancer *n.* the discipline that concerns the collection, organization, analysis, interpretation, and presentation of data
124. two-ph__e structure *n.* any stage in a series of events, change, or development
125. imp_____ly known disease *adv.* in a faulty or incomplete way
126. beam of el_____ons *n.* a tiny particle with the negative electrical charge
127. laws of ph_____s *n.* the science of matter and energy and their interactions
128. small in_____nts *n.* a regular increase in the amount of something, such as money; a process of becoming larger, longer, or more important
129. ph____n energy *n.* a unit or quantum of electromagnetic energy, typically regarded as a particle that is the basic constituent of all light and other forms of electromagnetic radiation
130. participation aw__d *n.* a prize or other mark of recognition given in honor of an achievement
131. the great di_____ry of the century *n.* the act or process of finding information, a place, or an object, or learning about something that was previously not known
132. in_____te the room from sound *v.* to protect something by interposing material that prevents heat, noise, electricity, etc.

ANSWERS: 122. revolutionize, 123. statistics, 124. phase, 125. imperfectly, 126. electron, 127. physics, 128. increment, 129. photon, 130. award, 131. discovery, 132. insulate

133. chocolate pr_____l *n.* a type of baked bread product that is twisted into a knot-like shape, usually sprinkled with salt, and often served as a snack or appetizer
134. st_____h along the coast *v.* to make or be capable of making anything longer or broader without hurting or breaking
135. mic_____ic inquiry *adj.* tiny; exceedingly precise and detail-oriented; of or used in microscopy
136. im____e thoughts *adj.* mixed with other substances or foreign matter; (of persons or behaviors) immoral or obscene, especially in sexual matters
137. enter on the last ph__e *n.* any stage in a series of events, change, or development
138. the degree of pu____y *n.* the state of being undiluted or unmixed with anything else; the state of being free from immorality, especially of a sexual nature
139. mat_____cs competition *n.* the science dealing with the logic of quantities, shapes, spaces, and arrangement
140. pio_____ng spirit *adj.* involving new ideas or methods; being the first of their kind; leading the way in a particular field
141. stripes cha_____tic of the zebra *n.* a typical feature or quality that can identify, tell apart, or describe something or somebody
142. take ad_____ge of his weak points *n.* a condition or circumstance that puts one in a favorable or superior position; a beneficial feature or asset that someone or something has

ANSWERS: 133. pretzel, 134. stretch, 135. microscopic, 136. impure, 137. phase, 138. purity, 139. mathematics, 140. pioneering, 141. characteristic, 142. advantage

143. degree of ac____cy *n.* the state or degree of being exact or correct; the ability to perform something with proficiency and without mistake
144. ex___c vacation *adj.* originating from or characteristic of a foreign country or culture; strikingly unusual, uncommon, or intriguing
145. work do__h *n.* a mixture of flour, liquid, and other ingredients, typically used to make bread, pastry, or pasta
146. quantum qu__t *n.* a unit of information used in quantum computing, equivalent to a single binary digit (or "bit") of classical computing, which can exist in multiple possible states simultaneously, offering greater information processing potential than classical bits
147. a man of pr____ty *n.* a thing or things that belong to someone
148. parallel com_____on *n.* the act or process of calculating something, especially an answer or amount, by using a machine or calculator

ANSWERS: 143. accuracy, 144. exotic, 145. dough, 146. qubit, 147. property, 148. computation

Session 3: Fill in the Blanks

1. Every human is responsible for taking care of the Earth's _____.
n. the natural world such as air, water, and land in which humans, animals, and plants live
2. He won the _____ for best actor at the film festival.
n. a prize or other mark of recognition given in honor of an achievement
3. The policy should increase the country's monetary _____.
n. the quality or attribute of being firm and steadfast
4. He does not _____ importance to these rumors.
v. to fasten, join, or connect one thing to another
5. Higher _____ requires additional equipment and energy.
n. the state of being undiluted or unmixed with anything else; the state of being free from immorality, especially of a sexual nature
6. The bid _____ for this auction is \$100.
n. a regular increase in the amount of something, such as money; a process of becoming larger, longer, or more important
7. Big techs are now eager to develop _____ computers.
n. the smallest amount or unit of something, especially (electromagnetic) energy
8. Other technology industries _____ similarly explosive growth.
v. to show something in public for people to enjoy or to provide them with information

ANSWERS: 1. environment, 2. award, 3. stability, 4. attach, 5. purity, 6. increment, 7. quantum, 8. exhibit

9. Infrared cameras detect _____ in the infrared range of the electromagnetic spectrum.
- n.* a unit or quantum of electromagnetic energy, typically regarded as a particle that is the basic constituent of all light and other forms of electromagnetic radiation
10. I tried to _____ the efficiency of the investment.
- v.* to make a mathematical calculation
11. The era of the industrial revolution was a crucial _____ of history.
- n.* any stage in a series of events, change, or development
12. She was _____ about her friend's intentions.
- adj.* not being sure of something; not being able to choose
13. There are various hypotheses concerning the _____ of life.
- n.* the first existence or beginning of something
14. He studied the _____ of radiation.
- n.* the science of matter and energy and their interactions
15. His speech was carefully crafted and delivered with _____ confidence.
- adj.* deliberately considered or scrutinized; carefully thought out or planned
16. I'm going to take the _____ to get to my destination faster.
- n.* a main road, especially one connecting major towns or cities
17. Carbon has an _____ mass of 12.
- adj.* of or relating to atom (= the smallest component of an element)

ANSWERS: 9. photons, 10. compute, 11. phase, 12. uncertain, 13. origin, 14. physics, 15. studied, 16. highway, 17. atomic

18. She falls over _____ when she sees her mother-in-law.

adv. at, to, or toward the direction or place that is behind or rear

19. 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

20. 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

21. Enhanced rail _____ is crucial for our business.

n. a system for moving people or products from one location to another using automobiles, roads, and so on

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

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

23. This building construction causes serious _____ to residents.

n. something that interrupts a settled and peaceful condition or that makes someone feel nervous or worried

24. The _____ of the two groups is good for brainstorming.

n. the act of connecting with someone, mainly when working, playing, or spending time with them

25. To assure _____ I recommend investing in high-quality test kits.

n. the state or degree of being exact or correct; the ability to perform something with proficiency and without mistake

ANSWERS: 18. backward, 19. particles, 20. orbit, 21. transportation, 22. stable, 23. disturbance, 24. interaction, 25. accuracy,

26. The _____ view of the galaxy is simply breathtaking.

adj. visible to the naked eye; relating to objects or phenomena that are large enough to be seen without the aid of a microscope or other magnifying tools

27. The invention of the smartphone _____ the way we communicate with each other.

v. to bring about a complete or radical change in something, often through the introduction of new methods or ideas

28. He stood to inherit a million-dollar _____.

n. a thing or things that belong to someone

29. The building was _____ in the fire and had to be rebuilt.

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

30. He created an _____ shaped torso.

adv. in a faulty or incomplete way

31. Human behavior has _____ characteristics.

adj. forming an essential base or core from which everything else develops or is affected

32. In some religions, pork is deemed _____.

adj. mixed with other substances or foreign matter; (of persons or behaviors) immoral or obscene, especially in sexual matters

33. My father's death _____ my life completely.

v. to change in outward structure or looks;

ANSWERS: 26. macroscopic, 27. revolutionized, 28. property, 29. destroyed, 30. imperfectly, 31. fundamental, 32. impure, 33. transformed

34. High thermal _____ is also essential for the exterior of the machine.
n. the quality of a material's ability to conduct electricity, heat, etc.
35. The _____ remains mysterious to us.
n. a type of question that describes something in a difficult and confusing way, and that has a surprising answer, often asked as a game
36. Bananas have their _____ taste and odor.
n. a typical feature or quality that can identify, tell apart, or describe something or somebody
37. As people get old, their energies may _____.
v. to reduce or be reduced in size, extent, or importance; to make something smaller, weaker, etc.
38. Technology development for controlling _____ is a major research goal in quantum computing.
n. a unit of information used in quantum computing, equivalent to a single binary digit (or "bit") of classical computing, which can exist in multiple possible states simultaneously, offering greater information processing potential than classical bits
39. The _____ demonstrate that poverty and unemployment are genuine problems.
n. the discipline that concerns the collection, organization, analysis, interpretation, and presentation of data
40. He displayed the _____ symptoms of depression.
adj. judged or deserving to be regarded as one of the best or most important of its kind over a period of time; of a well-known type

ANSWERS: 34. conductivity, 35. riddle, 36. characteristic, 37. diminish, 38. qubits, 39. statistics, 40. classic

41. The product developed through years of research continues to _____ the market.
- v.* to make a machine or system work by using electricity; to make someone extremely enthusiastic about or interested in something
42. I love snacking on _____ while watching a movie at home.
- n.* a type of baked bread product that is twisted into a knot-like shape, usually sprinkled with salt, and often served as a snack or appetizer
43. Her research team made an important _____.
- n.* the act or process of finding information, a place, or an object, or learning about something that was previously not known
44. I love trying _____ foods from different cultures.
- adj.* originating from or characteristic of a foreign country or culture; strikingly unusual, uncommon, or intriguing
45. The official transcript contains _____ academic records.
- adj.* correct and exact in all details
46. We had our bedroom _____ before winter came.
- v.* to protect something by interposing material that prevents heat, noise, electricity, etc.
47. The _____ force of the earth keeps our planet spinning.
- adj.* having the properties of attracting or repelling certain materials containing iron or steel
48. The mathematician studied the _____ of different shapes and spaces.
- n.* a branch of mathematics that deals with the properties of space that are preserved under continuous transformations, such as stretching, bending, and twisting, without tearing or gluing

ANSWERS: 41. electrify, 42. pretzels, 43. discovery, 44. exotic, 45. accurate, 46. insulated, 47. magnetic, 48. topology

49. She mixed flour, yeast, sugar, and water to make _____ for the bread.
n. a mixture of flour, liquid, and other ingredients, typically used to make bread, pastry, or pasta
50. Since the 1990s, the Internet has continued to experience _____ growth.
adj. becoming more and more rapid; of or involving mathematical exponents
51. Inspectors noticed _____ cracks in the submarine's hull.
adj. tiny; exceedingly precise and detail-oriented; of or used in microscopy
52. Police will _____ random breath testing for drunk driving.
v. to organize and carry out a particular activity
53. The company specializes in manufacturing and selling cutting-edge _____.
n. the branch of physics and technology that deals with the behavior and control of electrons and the use of electronic devices and systems
54. He has a flair for _____.
n. the science dealing with the logic of quantities, shapes, spaces, and arrangement
55. The investigation _____ several government agencies and is expected to take several months.
v. to include or affect someone or something as a necessary part of something else
56. Her _____ accent made it difficult to take her seriously.
adj. influenced; feeling or showing emotion, especially exaggerated emotion; not natural or sincere

ANSWERS: 49. dough, 50. exponential, 51. microscopic, 52. conduct, 53. electronics, 54. mathematics, 55. involves, 56. affected

57. One of the main _____ of the new product is its increased efficiency.
- n.* a condition or circumstance that puts one in a favorable or superior position; a beneficial feature or asset that someone or something has
58. The invention of the camera triggered the development of _____ painting.
- adj.* based on general ideas, feelings, or qualities and not on any a physical or concrete existence
59. The researcher demonstrated the superiority of quantum _____ in several mathematical tasks.
- n.* the act or process of calculating something, especially an answer or amount, by using a machine or calculator
60. The _____ will repair my telephone tomorrow morning.
- n.* a person whose job is designing, building, or maintaining something such as machines, structures, or software
61. The _____ of the tree had fallen and blocked the road.
- n.* a division of a tree or woody shrub that grows out from the trunk or a main stem; a division of some larger or more complex organization
62. The advent of the Internet completely _____ the manufacturing industry.
- v.* to change the form or structure of something
63. The _____ scientist developed a breakthrough technology that revolutionized the industry.
- adj.* involving new ideas or methods; being the first of their kind; leading the way in a particular field
64. When the first molecule in the _____ receives a signal, it activates other molecules.
- n.* a track that constitutes or serves as a path; an approach or a way of doing something

ANSWERS: 57. advantages, 58. abstract, 59. computation, 60. engineer, 61. branch, 62. reshaped, 63. pioneering, 64. pathway

65. Sensors convert physical phenomena into _____ signals.

adj. processing or storing information as a succession of 1 and 0 to show that a signal is present or missing; relating to the use of computer technology, especially the internet

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

n. a tiny particle with the negative electrical charge

67. Many people in this city use the _____ railway for transportation.

n. a shape like a curve or a circle made by something long and thin, such as a piece of string, that bends round and crosses itself

68. The fresh green trees cast a _____ web of shadows over the lawn.

adj. very fine, subtle, and pleasing; easily broken or damaged or destroyed

69. The election was a _____ success for the Whigs.

adj. worthy of attention because unusual or special

70. Some herds have been observed to _____ hundreds of kilometers.

v. to make or be capable of making anything longer or broader without hurting or breaking

71. The country experienced a _____ increase in population.

adj. happening slowly over a long period of time or distance; not steep or abrupt

72. Bell-bottom jeans, once considered _____ fashion, have made a surprising comeback in recent years.

adj. no longer fashionable or current; outdated; considered to be old-fashioned or out of date

ANSWERS: 65. digital, 66. electron, 67. loop, 68. delicate, 69. remarkable, 70. stretch, 71. gradual, 72. passe

73. The new washing machine is much more _____ than the old one.

adj. performing at the highest level of productivity with the least wasted effort or resources; capable of achieving maximum output with minimum wasted effort, time, or materials

74. 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: 73. efficient, 74. stick