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Vocabulary Builder Reference from...

Geoffrey West: The surprising math of cities and corporations | TED Talk

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

Advanced Words Only

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Session 1: Word List

crucible

n. a vessel made of ceramic, metal, or other materials used for melting or fusing substances at high temperatures; a difficult or trying experience that tests one's character or resilience

synonym : melting pot, cauldron, furnace

(1) electric **crucible** furnace, (2) fire **crucible**

The scientific experiment required the use of a high-temperature **crucible**.

urbanization

n. the process of population growth and physical expansion of cities, often involving increased migration from rural areas and the development of urban infrastructure and culture

synonym : urban development, urban growth, urban expansion

(1) **urbanization** process, (2) non- **urbanization** area

Rapid **urbanization** has led to many environmental and social issues in cities.

numb

adj. unable to feel physical sensation and movement; not showing human feeling or sensitivity

synonym : dazed, insensitive, emotionless

(1) **numb** with cold, (2) a **numb** mind

My left arm became **numb**.

urbanize

v. to make an area more urban in character or nature, often through the development and expansion of cities or towns

synonym : develop, modernize, city-build

(1) **urbanize** a region, (2) **urbanize** transportation systems
The government plans to **urbanize** the rural area by building more housing units and improving transportation infrastructure.

foresee

v. to perceive or predict; to anticipate or expect something to happen in the future

synonym : predict, anticipate, forecast

(1) **foresee** the consequences, (2) **foresee** challenges
I **foresee** a problem arising if we don't address this issue now.

comrade

n. a close associate, friend, or companion, especially one who shares one's interests, beliefs, or political convictions; a fellow member of an organization, especially a military or political group, who shares a common cause or objective

synonym : ally, friend, mate

(1) **comrade** in arms, (2) trusted **comrade**
We worked together as **comrades** to finish the project on time.

entropy

n. a scientific concept that is most commonly associated with a state of disorder, randomness, or uncertainty

synonym : randomness

(1) **entropy** calculation, (2) **entropy** conservation
Since the second law of thermodynamics is applicable to the universe, the **entropy** of the universe continues to increase.

provocative

adj. arousing anger, interest, or another strong reaction, especially deliberately

synonym : instigating, provoking, inciting

(1) **provocative** questions, (2) a **provocative** smile

His **provocative** style frequently sparked controversies.

quantifiable

adj. able to be measured, expressed, or quantified in numerical or statistical terms

synonym: measurable, calculable

(1) non- **quantifiable** risk, (2) **quantifiable** results

The impact of the new policy will be **quantifiable** through measurable data.

conceivable

adj. imaginable or possible to understand or believe in the mind

synonym: believable, imaginable, probable

(1) **conceivable** way, (2) **conceivable** emergency

It is challenging to defend every **conceivable** target.

anthill

n. a mound or hill made by a colony of ants, often as a nest or shelter, which can vary in size and shape depending on the species of ant and the surrounding environment

synonym: ant nest, ant mound, formicary

(1) **anthill** colony, (2) **anthill** on the trail

The ants were busy building an **anthill** in the garden.

mammal

n. any animal of which the female gives birth to live young, not eggs, and feeds her young on milk from her own body

(1) a primitive **mammal**, (2) a sort of **mammal**

Marine **mammal** populations are declining worldwide due to ocean pollution.

resilient

adj. able to withstand or recover quickly from difficult conditions

synonym: robust, sturdy, tough

(1) a hard and **resilient** steel, (2) **resilient** population

She is a **resilient** person and has always bounced back from setbacks.

astonishing

adj. surprising or shocking; difficult to believe

synonym : surprising, shocking, astounding

(1) **astonishing** achievement, (2) make **astonishing** gains
The news of her sudden death was **astonishing** to everyone who knew her.

constrain

v. to restrict or limit someone or something's freedom or ability to do something

synonym : restrict, limit, confine

(1) **constrain** his freedom, (2) **constrain** information flow
The political situation **constrained** the country's economic growth and foreign relations.

well-defined

adj. having clear and precise boundaries or characteristics; distinctly outlined or delimited; easily understood or recognizable

synonym : clear, distinct, precise

(1) **well-defined** terms, (2) **well-defined** objectives
The **well-defined** set of instructions made it easy to assemble the furniture.

capita

n. a Latin word meaning "head," used to express the amount for each person; any head or headlike expansion on a structure, as on a bone

synonym : head, headcount, person

(1) per **capita** sales, (2) the agricultural yield per **capita**
GDP per **capita** shrunk by almost 10 percent for the third consecutive year.

regularity

n. the quality or state of being done often; conformity to a set of rules, standards, or expectations; the state of occurring with a consistent or predictable pattern or frequency

synonym : consistency, uniformity, regularness

(1) the **regularity** of his breathing, (2) sleep **regularity**
The **regularity** of exercise is important for maintaining good health.

intracellular

adj. existing or occurring within the cells of an organism or structure; situated or taking place within the boundaries of a cell

synonym : cellular, intracellularly

(1) **intracellular** compartment, (2) **intracellular** parasites

The **intracellular** signaling pathways play a crucial role in cellular communication.

multicellular

adj. characterized by the presence of multiple or many cells, as opposed to unicellular (having only one cell)

synonym : multicelled, many-celled, complex

(1) **multicellular** tissues, (2) **multicellular** life

Multicellular organisms are composed of many specialized cells working together.

circulatory

adj. relating to the system that moves blood through the body, which includes the heart, arteries, and veins

synonym : circulative, rotating

(1) a **circulatory** disease, (2) cause **circulatory** failure shock

The **circulatory** system of the animal is also responsible for heat transportation.

manifestation

n. a visible or tangible form of something, especially a particular sign of a disease or condition

synonym : expression, embodiment, presentation

(1) **manifestation** of a deeper problem, (2) **manifestation** of psychological stress

The **manifestation** of his anxiety was evident in his shaking hands.

mundane

adj. very ordinary and therefore lacking interest or excitement

synonym : ordinary, everyday, prosaic

(1) **mundane** affairs, (2) **mundane** objects

After returning from the war, he had a pretty **mundane** life.

socioeconomic

adj. relating to the social and economic factors that shape an individual, group, or community, particularly in terms of income, occupation, education, and social class

synonym : social, economic, financial

(1) **socioeconomic** status, (2) **socioeconomic** issues

The **socioeconomic** conditions of a country can significantly affect its political stability.

exponent

n. a person who supports and promotes a particular theory, idea, or scheme; a numerical expression usually written as a superscript that indicates the number of times a given number or expression is to be multiplied by itself

synonym : advocate, representative, exponent

(1) **exponent** function, (2) the **exponent** of the free market

The CEO is an **exponent** of innovation and encourages employees to think outside the box.

sigmoid

adj. relating to or shaped like the letter "S"

synonym : curved, bent, twisted

(1) **sigmoid** curve, (2) **sigmoid** artery

The doctor examined the **sigmoid** colon to check for any abnormalities.

destine

v. to determine or set the course of something in advance, often in a way that seems predetermined or inevitable; to specify or choose someone or something for a particular fate or outcome

synonym : ordain, doom, predestine

(1) **destine** us to meet again, (2) be **destined** to become a great artist

Some people believe that we are all **destined** for greatness.

innovate

v. to introduce new methods, ideas, or products

synonym : bring in, introduce, found

(1) **innovate** a new method, (2) **innovate** the quality of his life

Companies developing self-driving cars consistently

innovate the emerging technologies.

treadmill

n. a piece of exercise equipment consisting of a moving belt on which the user walks, jogs, or runs in place; a monotonous, repetitive task or activity that feels like it is going nowhere, much like a person walking on a treadmill

synonym : exercise machine, routine

(1) **treadmill** workout, (2) nonstop **treadmill**

I like to watch TV while running on the **treadmill** to pass the time.

fluctuation

n. a change, or the process of changing, that frequently happens, especially from one extreme to another; the quality of being unsteady and subject to changes

synonym : change, instability, flux

(1) price **fluctuations**, (2) **fluctuation** of water level

Temperature **fluctuations** are often milder in oceanfront areas.

bureaucracy

n. a system of government in which most of the important decisions are made by state officials rather than by elected representatives

synonym : administration, government, system

(1) government **bureaucracy**, (2) arbitrary **bureaucracy**

The bumbling **bureaucracy** made it difficult to get the permits we needed.

Session 2: Spelling

1. arbitrary bur_____cy *n.* a system of government in which most of the important decisions are made by state officials rather than by elected representatives
2. government bur_____cy *n.* a system of government in which most of the important decisions are made by state officials rather than by elected representatives
3. si_____d curve *adj.* relating to or shaped like the letter "S"
4. soc_____mic issues *adj.* relating to the social and economic factors that shape an individual, group, or community, particularly in terms of income, occupation, education, and social class
5. tr_____ll workout *n.* a piece of exercise equipment consisting of a moving belt on which the user walks, jogs, or runs in place; a monotonous, repetitive task or activity that feels like it is going nowhere, much like a person walking on a treadmill
6. the ex_____nt of the free market *n.* a person who supports and promotes a particular theory, idea, or scheme; a numerical expression usually written as a superscript that indicates the number of times a given number or expression is to be multiplied by itself
7. per ca____a sales *n.* a Latin word meaning "head," used to express the amount for each person; any head or headlike expansion on a structure, as on a bone

ANSWERS: 1. bureaucracy, 2. bureaucracy, 3. sigmoid, 4. socioeconomic, 5. treadmill, 6. exponent, 7. capita

8. the reg_____ty of his breathing *n.* the quality or state of being done often; conformity to a set of rules, standards, or expectations; the state of occurring with a consistent or predictable pattern or frequency
9. wel_____ned objectives *adj.* having clear and precise boundaries or characteristics; distinctly outlined or delimited; easily understood or recognizable
10. n__b with cold *adj.* unable to feel physical sensation and movement; not showing human feeling or sensitivity
11. electric cr_____le furnace *n.* a vessel made of ceramic, metal, or other materials used for melting or fusing substances at high temperatures; a difficult or trying experience that tests one's character or resilience
12. fo_____e the consequences *v.* to perceive or predict; to anticipate or expect something to happen in the future
13. a cir_____ry disease *adj.* relating to the system that moves blood through the body, which includes the heart, arteries, and veins
14. ex_____nt function *n.* a person who supports and promotes a particular theory, idea, or scheme; a numerical expression usually written as a superscript that indicates the number of times a given number or expression is to be multiplied by itself
15. mu_____e affairs *adj.* very ordinary and therefore lacking interest or excitement

ANSWERS: 8. regularity, 9. well-defined, 10. numb, 11. crucible, 12. foresee, 13. circulatory, 14. exponent, 15. mundane

16. price flu_____ons *n.* a change, or the process of changing, that frequently happens, especially from one extreme to another; the quality of being unsteady and subject to changes
17. in_____te the quality of his life *v.* to introduce new methods, ideas, or products
18. co_____e in arms *n.* a close associate, friend, or companion, especially one who shares one's interests, beliefs, or political convictions; a fellow member of an organization, especially a military or political group, who shares a common cause or objective
19. a pro_____ve smile *adj.* arousing anger, interest, or another strong reaction, especially deliberately
20. a primitive ma____l *n.* any animal of which the female gives birth to live young, not eggs, and feeds her young on milk from her own body
21. non-urb_____ion area *n.* the process of population growth and physical expansion of cities, often involving increased migration from rural areas and the development of urban infrastructure and culture
22. con_____le emergency *adj.* imaginable or possible to understand or believe in the mind
23. ur_____ze transportation systems *v.* to make an area more urban in character or nature, often through the development and expansion of cities or towns
24. be de_____ed to become a great artist *v.* to determine or set the course of something in advance, often in a way that seems predetermined or inevitable; to specify or choose someone or something for a particular fate or outcome

ANSWERS: 16. fluctuation, 17. innovate, 18. comrade, 19. provocative, 20. mammal, 21. urbanization, 22. conceivable, 23. urbanize, 24. destine

25. fire cr_____le *n.* a vessel made of ceramic, metal, or other materials used for melting or fusing substances at high temperatures; a difficult or trying experience that tests one's character or resilience
26. wel_____ned terms *adj.* having clear and precise boundaries or characteristics; distinctly outlined or delimited; easily understood or recognizable
27. man_____ion of psychological stress *n.* a visible or tangible form of something, especially a particular sign of a disease or condition
28. a n__b mind *adj.* unable to feel physical sensation and movement; not showing human feeling or sensitivity
29. ast_____ng achievement *adj.* surprising or shocking; difficult to believe
30. a hard and re_____nt steel *adj.* able to withstand or recover quickly from difficult conditions
31. nonstop tr_____ll *n.* a piece of exercise equipment consisting of a moving belt on which the user walks, jogs, or runs in place; a monotonous, repetitive task or activity that feels like it is going nowhere, much like a person walking on a treadmill
32. man_____ion of a deeper problem *n.* a visible or tangible form of something, especially a particular sign of a disease or condition
33. in_____te a new method *v.* to introduce new methods, ideas, or products

ANSWERS: 25. crucible, 26. well-defined, 27. manifestation, 28. numb, 29. astonishing, 30. resilient, 31. treadmill, 32. manifestation, 33. innovate

34. soc_____mic status *adj.* relating to the social and economic factors that shape an individual, group, or community, particularly in terms of income, occupation, education, and social class
35. pro_____ve questions *adj.* arousing anger, interest, or another strong reaction, especially deliberately
36. de_____e us to meet again *v.* to determine or set the course of something in advance, often in a way that seems predetermined or inevitable; to specify or choose someone or something for a particular fate or outcome
37. si_____d artery *adj.* relating to or shaped like the letter "S"
38. co_____in his freedom *v.* to restrict or limit someone or something's freedom or ability to do something
39. int_____lar parasites *adj.* existing or occurring within the cells of an organism or structure; situated or taking place within the boundaries of a cell
40. flu_____on of water level *n.* a change, or the process of changing, that frequently happens, especially from one extreme to another; the quality of being unsteady and subject to changes
41. re_____nt population *adj.* able to withstand or recover quickly from difficult conditions
42. the agricultural yield per ca____a *n.* a Latin word meaning "head," used to express the amount for each person; any head or headlike expansion on a structure, as on a bone

ANSWERS: 34. socioeconomic, 35. provocative, 36. destine, 37. sigmoid, 38. constrain, 39. intracellular, 40. fluctuation, 41. resilient, 42. capita

43. mul_____lar tissues *adj.* characterized by the presence of multiple or many cells, as opposed to unicellular (having only one cell)
44. an_____l colony *n.* a mound or hill made by a colony of ants, often as a nest or shelter, which can vary in size and shape depending on the species of ant and the surrounding environment
45. trusted co_____e *n.* a close associate, friend, or companion, especially one who shares one's interests, beliefs, or political convictions; a fellow member of an organization, especially a military or political group, who shares a common cause or objective
46. a sort of ma_____l *n.* any animal of which the female gives birth to live young, not eggs, and feeds her young on milk from her own body
47. make ast_____ng gains *adj.* surprising or shocking; difficult to believe
48. an_____l on the trail *n.* a mound or hill made by a colony of ants, often as a nest or shelter, which can vary in size and shape depending on the species of ant and the surrounding environment
49. urb_____ion process *n.* the process of population growth and physical expansion of cities, often involving increased migration from rural areas and the development of urban infrastructure and culture

ANSWERS: 43. multicellular, 44. anthill, 45. comrade, 46. mammal, 47. astonishing, 48. anthill, 49. urbanization

50. fo____e challenges *v.* to perceive or predict; to anticipate or expect something to happen in the future
51. mul____lar life *adj.* characterized by the presence of multiple or many cells, as opposed to unicellular (having only one cell)
52. int____lar compartment *adj.* existing or occurring within the cells of an organism or structure; situated or taking place within the boundaries of a cell
53. mu____e objects *adj.* very ordinary and therefore lacking interest or excitement
54. ur____ze a region *v.* to make an area more urban in character or nature, often through the development and expansion of cities or towns
55. sleep reg____ty *n.* the quality or state of being done often; conformity to a set of rules, standards, or expectations; the state of occurring with a consistent or predictable pattern or frequency
56. en____y calculation *n.* a scientific concept that is most commonly associated with a state of disorder, randomness, or uncertainty
57. co____in information flow *v.* to restrict or limit someone or something's freedom or ability to do something
58. en____y conservation *n.* a scientific concept that is most commonly associated with a state of disorder, randomness, or uncertainty

ANSWERS: 50. foresee, 51. multicellular, 52. intracellular, 53. mundane, 54. urbanize, 55. regularity, 56. entropy, 57. constrain, 58. entropy

59. con_____le way *adj.* imaginable or possible to understand or believe in the mind
60. cause cir_____ry failure shock *adj.* relating to the system that moves blood through the body, which includes the heart, arteries, and veins
61. non-qua_____ble risk *adj.* able to be measured, expressed, or quantified in numerical or statistical terms
62. qua_____ble results *adj.* able to be measured, expressed, or quantified in numerical or statistical terms

ANSWERS: 59. conceivable, 60. circulatory, 61. quantifiable, 62. quantifiable

Session 3: Fill in the Blanks

1. Some people believe that we are all _____ for greatness.
 - v.* to determine or set the course of something in advance, often in a way that seems predetermined or inevitable; to specify or choose someone or something for a particular fate or outcome
2. The _____ signaling pathways play a crucial role in cellular communication.
 - adj.* existing or occurring within the cells of an organism or structure; situated or taking place within the boundaries of a cell
3. The ants were busy building an _____ in the garden.
 - n.* a mound or hill made by a colony of ants, often as a nest or shelter, which can vary in size and shape depending on the species of ant and the surrounding environment
4. The _____ of his anxiety was evident in his shaking hands.
 - n.* a visible or tangible form of something, especially a particular sign of a disease or condition
5. The impact of the new policy will be _____ through measurable data.
 - adj.* able to be measured, expressed, or quantified in numerical or statistical terms
6. Since the second law of thermodynamics is applicable to the universe, the _____ of the universe continues to increase.
 - n.* a scientific concept that is most commonly associated with a state of disorder, randomness, or uncertainty
7. She is a _____ person and has always bounced back from setbacks.
 - adj.* able to withstand or recover quickly from difficult conditions

ANSWERS: 1. destined, 2. intracellular, 3. anthill, 4. manifestation, 5. quantifiable, 6. entropy, 7. resilient

8. The _____ of exercise is important for maintaining good health.
- n.* the quality or state of being done often; conformity to a set of rules, standards, or expectations; the state of occurring with a consistent or predictable pattern or frequency
9. GDP per _____ shrunk by almost 10 percent for the third consecutive year.
- n.* a Latin word meaning "head," used to express the amount for each person; any head or headlike expansion on a structure, as on a bone
10. The political situation _____ the country's economic growth and foreign relations.
- v.* to restrict or limit someone or something's freedom or ability to do something
11. The scientific experiment required the use of a high-temperature _____.
- n.* a vessel made of ceramic, metal, or other materials used for melting or fusing substances at high temperatures; a difficult or trying experience that tests one's character or resilience
12. The _____ set of instructions made it easy to assemble the furniture.
- adj.* having clear and precise boundaries or characteristics; distinctly outlined or delimited; easily understood or recognizable
13. The doctor examined the _____ colon to check for any abnormalities.
- adj.* relating to or shaped like the letter "S"
14. The _____ system of the animal is also responsible for heat transportation.
- adj.* relating to the system that moves blood through the body, which includes the heart, arteries, and veins

ANSWERS: 8. regularity, 9. capita, 10. constrained, 11. crucible, 12. well-defined, 13. sigmoid, 14. circulatory

15. We worked together as _____ to finish the project on time.
- n.* a close associate, friend, or companion, especially one who shares one's interests, beliefs, or political convictions; a fellow member of an organization, especially a military or political group, who shares a common cause or objective
16. I like to watch TV while running on the _____ to pass the time.
- n.* a piece of exercise equipment consisting of a moving belt on which the user walks, jogs, or runs in place; a monotonous, repetitive task or activity that feels like it is going nowhere, much like a person walking on a treadmill
17. The CEO is an _____ of innovation and encourages employees to think outside the box.
- n.* a person who supports and promotes a particular theory, idea, or scheme; a numerical expression usually written as a superscript that indicates the number of times a given number or expression is to be multiplied by itself
18. My left arm became _____.
- adj.* unable to feel physical sensation and movement; not showing human feeling or sensitivity
19. _____ organisms are composed of many specialized cells working together.
- adj.* characterized by the presence of multiple or many cells, as opposed to unicellular (having only one cell)
20. The news of her sudden death was _____ to everyone who knew her.
- adj.* surprising or shocking; difficult to believe
21. I _____ a problem arising if we don't address this issue now.
- v.* to perceive or predict; to anticipate or expect something to happen in the future

ANSWERS: 15. comrades, 16. treadmill, 17. exponent, 18. numb, 19. Multicellular, 20. astonishing, 21. foresee

22. Rapid _____ has led to many environmental and social issues in cities.
- n.* the process of population growth and physical expansion of cities, often involving increased migration from rural areas and the development of urban infrastructure and culture
23. Marine _____ populations are declining worldwide due to ocean pollution.
- n.* any animal of which the female gives birth to live young, not eggs, and feeds her young on milk from her own body
24. His _____ style frequently sparked controversies.
- adj.* arousing anger, interest, or another strong reaction, especially deliberately
25. It is challenging to defend every _____ target.
- adj.* imaginable or possible to understand or believe in the mind
26. The _____ conditions of a country can significantly affect its political stability.
- adj.* relating to the social and economic factors that shape an individual, group, or community, particularly in terms of income, occupation, education, and social class
27. Companies developing self-driving cars consistently _____ the emerging technologies.
- v.* to introduce new methods, ideas, or products
28. The government plans to _____ the rural area by building more housing units and improving transportation infrastructure.
- v.* to make an area more urban in character or nature, often through the development and expansion of cities or towns

ANSWERS: 22. urbanization, 23. mammal, 24. provocative, 25. conceivable, 26. socioeconomic, 27. innovate, 28. urbanize

29. Temperature _____ are often milder in oceanfront areas.

n. a change, or the process of changing, that frequently happens, especially from one extreme to another; the quality of being unsteady and subject to changes

30. The bumbling _____ made it difficult to get the permits we needed.

n. a system of government in which most of the important decisions are made by state officials rather than by elected representatives

31. After returning from the war, he had a pretty _____ life.

adj. very ordinary and therefore lacking interest or excitement

ANSWERS: 29. fluctuations, 30. bureaucracy, 31. mundane