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Karl Skjonnemand: The self-assembling computer chips of the future | TED Talk

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

Advanced Words Only

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Session 1: Word List

transistor

n. a semiconductor device that can be used to amplify or switch electronic signals and power which is an essential component in modern electronics

synonym : semiconductor, microchip, circuit

(1) **transistor** radio, (2) **transistor** circuit

The invention of the **transistor** revolutionized the field of electronics.

roadblock

n. a physical barrier or obstacle that prevents progress or movement; a situation that impedes progress or creates difficulty in achieving a goal or objective

synonym : obstacle, barrier, blockade

(1) biological **roadblock**, (2) bypass **roadblock**

The accident caused a **roadblock** on the highway, causing traffic to come to a standstill.

relentless

adj. persistent and determined; continuing despite difficulties or setbacks

synonym : unyielding, tireless, unremitting

(1) **relentless** attack, (2) face **relentless** pressure

The athlete's **relentless** training paid off in the end.

augment

v. to increase the size, extent, quantity, etc. of something by adding something to it

synonym: boost, increase, expand

(1) **augment** the reality, (2) **augment** immunity

Economic factors and monetary policy **augmented** inflation.

treacherous

adj. that cannot be trusted; malicious; hazardous, even while seeming safe

synonym: dangerous, unfaithful, disloyal

(1) **treacherous** territory, (2) **treacherous** act

Due to snow and ice, many roads have become **treacherous**, and motorists are advised to travel gently.

chaotic

adj. without any order or organization; extremely disorganized, unpredictable, and confusing

synonym: disorderly, cluttered, topsy-turvy

(1) the **chaotic** economic situation, (2) **chaotic** theory

Change is also occurring in Turkey as a result of **chaotic** reform.

smartphone

n. a mobile phone that functions as a computer and connects to the Internet

(1) **smartphone** app developer, (2) **smartphone** addict

Internet traffic volumes have increased significantly with the advent of **smartphones**.

grind

v. to reduce something to small particles or powder by crushing or rubbing it; to work hard over a long period of time

synonym: mill, crush, grate

(1) **grind** away at my work, (2) **grind** your teeth

She had to **grind** the coffee beans before making a fresh cup.

industrious

adj. hardworking, diligent, and persistent in effort

synonym: diligent, hardworking, assiduous

(1) **industrious** worker, (2) **industrious** student

He was known to be very **industrious** and would often work late into the night.

bulky

adj. taking up much space or being difficult to move because of its size or weight; large and unwieldy

synonym : large, cumbersome, unwieldy

(1) **bulky** material, (2) **bulky** packaging

The **bulky** furniture made it difficult to move around the small room.

crystalline

adj. resembling crystal in clarity, transparency, or brilliance; having a highly ordered and symmetrical molecular structure

synonym : crystallized, clear, transparent

(1) **crystalline** structure, (2) **crystalline** water

The geologist found a beautiful specimen of a **crystalline** mineral.

wafer

n. a thin, flat, crisp biscuit or cake, often used as a communion element in religious services; a thin slice or piece of semiconductor material used in the production of computer chips and other electronic devices

synonym : thin cake, biscuit, disk

(1) strawberry **wafer**, (2) **wafer** cleaning system

The solar panel uses high-quality silicon **wafers** to convert sunlight into electricity efficiently.

nanoscale

adj. on a scale that can be measured in nanometres (= one billionth of a meter); on a very small scale

(1) **nanoscale** device, (2) things at the **nanoscale**

This process improves the strength of the metal by controlling the **nanoscale** lattice structure of the metal.

micron

n. a unit of measurement equal to one-millionth of a meter, used for measuring the size of particles and microorganisms

synonym : micrometer

(1) **micron** measurements, (2) **micron** imaging
The width of a single human hair is around 100 **microns**.

oversimplify

v. to describe or explain something in a way that is too simple and no longer holds true
(1) **oversimplify** the problem, (2) **oversimplify** a complex reality

People may **oversimplify** natural phenomena due to the improved accessibility of knowledge.

etch

v. to carve, cut, or engrave (a design or text) into a hard surface; to corrode, erode or eat away at a metal surface using acid or another chemical substance to create a design or pattern

synonym: engrave, inscribe, carve

(1) **etch** a metal plate, (2) **etch** a design into wood

He used a sharp tool to **etch** his initials onto the metal.

improvisation

n. the act of making something up on the spot or creating or performing something without preparation

synonym: spontaneity, ad-lib, extemporization

(1) **improvisation** on stage, (2) jazz **improvisation**

He created a beautiful piece of music using only **improvisation**.

mimic

v. to imitate someone's speech, movement, or behavior, especially to make others laugh

synonym: mirror, imitate, ape

(1) **mimic** a human voice, (2) **mimic** numerous instruments

He is very popular at school because he can **mimic** all the teachers' accents.

repel

v. to force an attack or attacker to withdraw or retreat

synonym: turn away, fight off, force back

(1) **repel** bandits, (2) **repel** bad luck

This material can **repel** moisture swiftly.

squirm

v. to twist, wiggle, or contort the body uncomfortably or awkwardly, often due to embarrassment, discomfort, or nervousness

synonym : squiggle, wiggle, writhe

(1) **squirm** uncomfortably, (2) **squirm** with excitement

The child **squirmed** out of his mother's grasp and ran off.

symmetrical

adj. having similarity in size, shape, and relative position of corresponding parts

synonym : harmonious, balanced, proportional

(1) **symmetrical** triangle, (2) **symmetrical** pattern

This figure is **symmetrical** about the x-axis.

meander

v. to wander or roam aimlessly or leisurely; to follow a winding or circuitous course, as a river or road

synonym : wander, zigzag, twist

(1) **meander** down the river, (2) **meander** aimlessly

We decided to **meander** through the park and enjoy the scenery.

fingerprint

n. a unique pattern of ridges and valleys on the surface of a finger that can be used to identify a person

synonym : print, mark, impression

(1) **fingerprint** at a crime scene, (2) **fingerprint** identification

The police used a **fingerprint** scanner to identify the suspect.

determinant

n. a factor, circumstance, or condition that contributes to the shaping, influencing, or determining of a particular outcome or result

synonym : cause, factor, element

(1) environmental **determinant**, (2) a **determinant** of crop yields

One **determinant** of success is having a positive attitude and a strong work ethic.

asymmetrical

adj. lacking symmetry or balance; unevenly or irregularly shaped; not corresponding in terms of quantity, size, or position

synonym : uneven, lopsided, crooked

(1) **asymmetrical** design, (2) **asymmetrical** haircut

The **asymmetrical** shape of the vase made it unique and exciting.

cleanliness

n. the state of being clean or free from dirt, dust, or foreign substances; the practice of maintaining good hygiene and cleanliness

synonym : neatness, hygiene, sanitation

(1) **cleanliness** standards, (2) **cleanliness** of the kitchen

We must prioritize our workplace's **cleanliness** for our employees' safety.

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.

disrupt

v. to prevent or stop something, especially an event, activity, or process, from continuing in the usual way by causing a problem or disturbance

synonym : interrupt, disturb, break into

(1) **disrupt** a well-ordered condition, (2) **disrupt** sleep

I'm so sorry to **disrupt** you when you're pretty busy.

Session 2: Spelling

1. mi___n imaging *n.* a unit of measurement equal to one-millionth of a meter, used for measuring the size of particles and microorganisms
2. mic_____ic analysis *adj.* tiny; exceedingly precise and detail-oriented; of or used in microscopy
3. ove_____ify a complex reality *v.* to describe or explain something in a way that is too simple and no longer holds true
4. au_____t immunity *v.* to increase the size, extent, quantity, etc. of something by adding something to it
5. mi___n measurements *n.* a unit of measurement equal to one-millionth of a meter, used for measuring the size of particles and microorganisms
6. wa__r cleaning system *n.* a thin, flat, crisp biscuit or cake, often used as a communion element in religious services; a thin slice or piece of semiconductor material used in the production of computer chips and other electronic devices
7. sq___m uncomfortably *v.* to twist, wiggle, or contort the body uncomfortably or awkwardly, often due to embarrassment, discomfort, or nervousness
8. face rel_____ss pressure *adj.* persistent and determined; continuing despite difficulties or setbacks

ANSWERS: 1. micron, 2. microscopic, 3. oversimplify, 4. augment, 5. micron, 6. wafer, 7. squirm, 8. relentless

9. tre_____us territory *adj.* that cannot be trusted; malicious; hazardous, even while seeming safe
10. cle_____ss standards *n.* the state of being clean or free from dirt, dust, or foreign substances; the practice of maintaining good hygiene and cleanliness
11. re__l bad luck *v.* to force an attack or attacker to withdraw or retreat
12. cle_____ss of the kitchen *n.* the state of being clean or free from dirt, dust, or foreign substances; the practice of maintaining good hygiene and cleanliness
13. things at the na_____le *adj.* on a scale that can be measured in nanometres (= one billionth of a meter); on a very small scale
14. environmental det_____nt *n.* a factor, circumstance, or condition that contributes to the shaping, influencing, or determining of a particular outcome or result
15. sym_____al triangle *adj.* having similarity in size, shape, and relative position of corresponding parts
16. bu__y packaging *adj.* taking up much space or being difficult to move because of its size or weight; large and unwieldy
17. strawberry wa__r *n.* a thin, flat, crisp biscuit or cake, often used as a communion element in religious services; a thin slice or piece of semiconductor material used in the production of computer chips and other electronic devices

ANSWERS: 9. treacherous, 10. cleanliness, 11. repel, 12. cleanliness, 13. nanoscale, 14. determinant, 15. symmetrical, 16. bulky, 17. wafer

18. e__h a design into wood *v.* to carve, cut, or engrave (a design or text) into a hard surface; to corrode, erode or eat away at a metal surface using acid or another chemical substance to create a design or pattern
19. me_____r aimlessly *v.* to wander or roam aimlessly or leisurely; to follow a winding or circuitous course, as a river or road
20. ind_____us worker *adj.* hardworking, diligent, and persistent in effort
21. mic_____ic inquiry *adj.* tiny; exceedingly precise and detail-oriented; of or used in microscopy
22. di_____t a well-ordered condition *v.* to prevent or stop something, especially an event, activity, or process, from continuing in the usual way by causing a problem or disturbance
23. di_____t sleep *v.* to prevent or stop something, especially an event, activity, or process, from continuing in the usual way by causing a problem or disturbance
24. imp_____ion on stage *n.* the act of making something up on the spot or creating or performing something without preparation
25. e__h a metal plate *v.* to carve, cut, or engrave (a design or text) into a hard surface; to corrode, erode or eat away at a metal surface using acid or another chemical substance to create a design or pattern
26. ove_____ify the problem *v.* to describe or explain something in a way that is too simple and no longer holds true

ANSWERS: 18. etch, 19. meander, 20. industrious, 21. microscopic, 22. disrupt, 23. disrupt, 24. improvisation, 25. etch, 26. oversimplify

27. mi__c numerous instruments *v.* to imitate someone's speech, movement, or behavior, especially to make others laugh
28. tre_____us act *adj.* that cannot be trusted; malicious; hazardous, even while seeming safe
29. re__l bandits *v.* to force an attack or attacker to withdraw or retreat
30. na_____le device *adj.* on a scale that can be measured in nanometres (= one billionth of a meter); on a very small scale
31. sma_____ne addict *n.* a mobile phone that functions as a computer and connects to the Internet
32. gr__d your teeth *v.* to reduce something to small particles or powder by crushing or rubbing it; to work hard over a long period of time
33. ind_____us student *adj.* hardworking, diligent, and persistent in effort
34. bu__y material *adj.* taking up much space or being difficult to move because of its size or weight; large and unwieldy
35. a det_____nt of crop yields *n.* a factor, circumstance, or condition that contributes to the shaping, influencing, or determining of a particular outcome or result
36. asy_____cal design *adj.* lacking symmetry or balance; unevenly or irregularly shaped; not corresponding in terms of quantity, size, or position
37. sma_____ne app developer *n.* a mobile phone that functions as a computer and connects to the Internet

ANSWERS: 27. mimic, 28. treacherous, 29. repel, 30. nanoscale, 31. smartphone, 32. grind, 33. industrious, 34. bulky, 35. determinant, 36. asymmetrical, 37. smartphone

38. rel_____ss attack *adj.* persistent and determined; continuing despite difficulties or setbacks
39. me_____r down the river *v.* to wander or roam aimlessly or leisurely; to follow a winding or circuitous course, as a river or road
40. the ch_____c economic situation *adj.* without any order or organization; extremely disorganized, unpredictable, and confusing
41. cry_____ne water *adj.* resembling crystal in clarity, transparency, or brilliance; having a highly ordered and symmetrical molecular structure
42. sym_____al pattern *adj.* having similarity in size, shape, and relative position of corresponding parts
43. ch_____c theory *adj.* without any order or organization; extremely disorganized, unpredictable, and confusing
44. jazz imp_____ion *n.* the act of making something up on the spot or creating or performing something without preparation
45. fin_____nt identification *n.* a unique pattern of ridges and valleys on the surface of a finger that can be used to identify a person
46. tra_____or radio *n.* a semiconductor device that can be used to amplify or switch electronic signals and power which is an essential component in modern electronics
47. mi__c a human voice *v.* to imitate someone's speech, movement, or behavior, especially to make others laugh

ANSWERS: 38. relentless, 39. meander, 40. chaotic, 41. crystalline, 42. symmetrical, 43. chaotic, 44. improvisation, 45. fingerprint, 46. transistor, 47. mimic

48. cry_____ne structure *adj.* resembling crystal in clarity, transparency, or brilliance; having a highly ordered and symmetrical molecular structure
49. biological ro_____ck *n.* a physical barrier or obstacle that prevents progress or movement; a situation that impedes progress or creates difficulty in achieving a goal or objective
50. bypass ro_____ck *n.* a physical barrier or obstacle that prevents progress or movement; a situation that impedes progress or creates difficulty in achieving a goal or objective
51. sq___m with excitement *v.* to twist, wiggle, or contort the body uncomfortably or awkwardly, often due to embarrassment, discomfort, or nervousness
52. au_____t the reality *v.* to increase the size, extent, quantity, etc. of something by adding something to it
53. gr__d away at my work *v.* to reduce something to small particles or powder by crushing or rubbing it; to work hard over a long period of time
54. fin_____nt at a crime scene *n.* a unique pattern of ridges and valleys on the surface of a finger that can be used to identify a person
55. tra_____or circuit *n.* a semiconductor device that can be used to amplify or switch electronic signals and power which is an essential component in modern electronics

ANSWERS: 48. crystalline, 49. roadblock, 50. roadblock, 51. squirm, 52. augment, 53. grind, 54. fingerprint, 55. transistor

56. asy_____cal haircut

adj. lacking symmetry or balance; unevenly or irregularly shaped; not corresponding in terms of quantity, size, or position

ANSWERS: 56. asymmetrical

Session 3: Fill in the Blanks

1. The _____ furniture made it difficult to move around the small room.
adj. taking up much space or being difficult to move because of its size or weight;
large and unwieldy

2. We decided to _____ through the park and enjoy the scenery.
v. to wander or roam aimlessly or leisurely; to follow a winding or circuitous
course, as a river or road

3. The child _____ out of his mother's grasp and ran off.
v. to twist, wiggle, or contort the body uncomfortably or awkwardly, often due to
embarrassment, discomfort, or nervousness

4. This material can _____ moisture swiftly.
v. to force an attack or attacker to withdraw or retreat

5. Economic factors and monetary policy _____ inflation.
v. to increase the size, extent, quantity, etc. of something by adding something to
it

6. Due to snow and ice, many roads have become _____ and motorists
are advised to travel gently.
adj. that cannot be trusted; malicious; hazardous, even while seeming safe

7. He used a sharp tool to _____ his initials onto the metal.
v. to carve, cut, or engrave (a design or text) into a hard surface; to corrode,
erode or eat away at a metal surface using acid or another chemical substance
to create a design or pattern

ANSWERS: 1. bulky, 2. meander, 3. squirmed, 4. repel, 5. augmented, 6.
treacherous, 7. etch

8. The athlete's _____ training paid off in the end.

adj. persistent and determined; continuing despite difficulties or setbacks

9. We must prioritize our workplace's _____ for our employees' safety.

n. the state of being clean or free from dirt, dust, or foreign substances; the practice of maintaining good hygiene and cleanliness

10. He created a beautiful piece of music using only _____.

n. the act of making something up on the spot or creating or performing something without preparation

11. People may _____ natural phenomena due to the improved accessibility of knowledge.

v. to describe or explain something in a way that is too simple and no longer holds true

12. He was known to be very _____ and would often work late into the night.

adj. hardworking, diligent, and persistent in effort

13. One _____ of success is having a positive attitude and a strong work ethic.

n. a factor, circumstance, or condition that contributes to the shaping, influencing, or determining of a particular outcome or result

14. Inspectors noticed _____ cracks in the submarine's hull.

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

15. This process improves the strength of the metal by controlling the _____ lattice structure of the metal.

adj. on a scale that can be measured in nanometres (= one billionth of a meter); on a very small scale

ANSWERS: 8. relentless, 9. cleanliness, 10. improvisation, 11. oversimplify, 12. industrious, 13. determinant, 14. microscopic, 15. nanoscale

16. The solar panel uses high-quality silicon _____ to convert sunlight into electricity efficiently.
- n.* a thin, flat, crisp biscuit or cake, often used as a communion element in religious services; a thin slice or piece of semiconductor material used in the production of computer chips and other electronic devices
17. I'm so sorry to _____ you when you're pretty busy.
- v.* to prevent or stop something, especially an event, activity, or process, from continuing in the usual way by causing a problem or disturbance
18. The invention of the _____ revolutionized the field of electronics.
- n.* a semiconductor device that can be used to amplify or switch electronic signals and power which is an essential component in modern electronics
19. The accident caused a _____ on the highway, causing traffic to come to a standstill.
- n.* a physical barrier or obstacle that prevents progress or movement; a situation that impedes progress or creates difficulty in achieving a goal or objective
20. He is very popular at school because he can _____ all the teachers' accents.
- v.* to imitate someone's speech, movement, or behavior, especially to make others laugh
21. Change is also occurring in Turkey as a result of _____ reform.
- adj.* without any order or organization; extremely disorganized, unpredictable, and confusing
22. Internet traffic volumes have increased significantly with the advent of _____.
- n.* a mobile phone that functions as a computer and connects to the Internet

ANSWERS: 16. wafers, 17. disrupt, 18. transistor, 19. roadblock, 20. mimic, 21. chaotic, 22. smartphones

23. The police used a _____ scanner to identify the suspect.
- n.* a unique pattern of ridges and valleys on the surface of a finger that can be used to identify a person
24. The width of a single human hair is around 100 _____.
- n.* a unit of measurement equal to one-millionth of a meter, used for measuring the size of particles and microorganisms
25. The _____ shape of the vase made it unique and exciting.
- adj.* lacking symmetry or balance; unevenly or irregularly shaped; not corresponding in terms of quantity, size, or position
26. The geologist found a beautiful specimen of a _____ mineral.
- adj.* resembling crystal in clarity, transparency, or brilliance; having a highly ordered and symmetrical molecular structure
27. This figure is _____ about the x-axis.
- adj.* having similarity in size, shape, and relative position of corresponding parts
28. She had to _____ the coffee beans before making a fresh cup.
- v.* to reduce something to small particles or powder by crushing or rubbing it; to work hard over a long period of time

ANSWERS: 23. fingerprint, 24. microns, 25. asymmetrical, 26. crystalline, 27. symmetrical, 28. grind