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Vocabulary Builder Reference from...

Jonathan Butterworth: What's the smallest thing in the universe? | TED Talk

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

Advanced Words Only

IMPORTANT

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Session 1: Word List

indivisible

adj. unable to be divided or separated; not subject to alteration or change

synonym : undividable, inseparable

(1) **indivisible** identity, (2) **indivisible** parts

Liberty and justice for all are **indivisible** concepts.

physicist

n. a scientist who specializes in the field of physics

(1) talented **physicist**, (2) theoretical **physicist**

Einstein was an outstanding and famous **physicist** of the 20th century.

encapsulate

v. to enclose or envelop something within a capsule or a membrane; to express or summarize the essence or core of something in a condensed form

synonym : enclose, contain, capsulize

(1) **encapsulate** the message, (2) **encapsulate** the essence

The movie can **encapsulate** the book's spirit, bringing it to life on screen.

rev

n. a measure of the rate at which an engine or motor rotates, often expressed in revolutions per minute (RPM); (verb) to increase the number of rotations per

minute

synonym : revolution, RPM, speed

(1) low- **rev** engine, (2) **rev** up the crowd

He stepped on the gas pedal, and the engine released a loud **rev**.

proton

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

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

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

quark

n. a type of elementary particle and a fundamental constituent of matter that make up the heavier elementary particles, such as protons, neutrons, etc.; fresh unripened cheese of a smooth texture made from pasteurized milk, a starter, and rennet

(1) **quark** physics, (2) the antiparticle of a **quark**

The Big Bang theory states that **quark-gluon** plasma filled the entire universe before matter as we know it was created.

gluon

n. a subatomic particle that binds quarks together in the nucleus of an atom, thus mediating the strong nuclear force

synonym : subatomic particle, nuclear force mediator

(1) **gluon** emission, (2) **gluon** interaction

The strong force, mediated by **gluons**, binds protons and neutrons in the atomic nucleus.

sibling

n. a brother or sister; member of a family born to the same parents

synonym : brother, sister, relative

(1) have a **sibling** quarrel, (2) play with my **siblings**

Children often copy their parents or elder **siblings**.

muon

n. a subatomic particle that is similar to an electron but is about 207 times heavier and is unstable, decaying into other particles after a short time

synonym : elementary particle, subatomic particle

(1) **muon** decay, (2) atmospheric **muon**

Cosmic rays consist mostly of protons and **muons**.

tau

n. the 19th letter of the Greek alphabet, transliterated as "t"; (of physics, tau particle) a fundamental particle known as the tau lepton that is an elementary particle with a negative electric charge and a spin of $1/2$

(1) **tau** particle, (2) the symbol of **tau**

The **tau** protein has been found to play a role in the development of Alzheimer's disease and other neurological disorders.

neutrino

n. a very small and electrically neutral particle with a very small mass that rarely reacts with other matter

(1) **neutrino** capture, (2) sterile **neutrinos**

This laboratory has a pool consisting of thousands of **neutrino** detectors.

antimatter

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

synonym : anti-substance, anti-nucleus, antiparticle

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

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

annihilate

v. to destroy completely; to cause something to cease to exist

synonym : destroy, obliterate, eradicate

(1) **annihilate** the enemy, (2) **annihilate** all doubts

The virus had the potential to **annihilate** entire populations if left unchecked.

boson

n. a type of subatomic particle that follows Bose-Einstein statistics, which determine how identical particles with integer spins behave

synonym : photon, gluon, particle

(1) weak **boson**, (2) Higgs **boson**

The search for new **boson** particles is one of the most exciting areas of modern physics.

ripple

n. a small wave on the surface of a liquid, typically caused by an object falling into it or a slight wind

synonym : wave, undulation, fluctuation

(1) a **ripple** of laughter, (2) **ripple** in the water

Many businesses felt the **ripple** effect of the economy's decline.

collide

v. to hit something violently when moving

synonym : clash, slam, contradict

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

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

unaccountable

adj. not able to be explained or justified, often in a way that suggests something suspicious or dishonest is going on; not responsible or answerable for one's actions or behavior

synonym : unexplainable, inexplicable, mysterious

(1) **unaccountable** behavior, (2) **unaccountable** decision

The **unaccountable** disappearance of funds led to an investigation.

Session 2: Spelling

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|--------------------------------|-----------|--|
| 1. co____e head-on | <i>v.</i> | to hit something violently when moving |
| 2. gl__n emission | <i>n.</i> | a subatomic particle that binds quarks together in the nucleus of an atom, thus mediating the strong nuclear force |
| 3. ant_____er propulsion | <i>n.</i> | matter made up of antiparticles, which have the same mass as regular matter but opposite electrical charges |
| 4. ne____no capture | <i>n.</i> | a very small and electrically neutral particle with a very small mass that rarely reacts with other matter |
| 5. Higgs bo__n | <i>n.</i> | a type of subatomic particle that follows Bose-Einstein statistics, which determine how identical particles with integer spins behave |
| 6. the symbol of t_u | <i>n.</i> | the 19th letter of the Greek alphabet, transliterated as "t"; (of physics, tau particle) a fundamental particle known as the tau lepton that is an elementary particle with a negative electric charge and a spin of 1/2 |
| 7. the antiparticle of a qu__k | <i>n.</i> | a type of elementary particle and a fundamental constituent of matter that make up the heavier elementary particles, such as protons, neutrons, etc.; fresh unripened cheese of a smooth texture made from pasteurized milk, a starter, and rennet |

ANSWERS: 1. collide, 2. gluon, 3. antimatter, 4. neutrino, 5. boson, 6. tau, 7. quark

- | | |
|----------------------------|---|
| 8. weak bo__n | <i>n.</i> a type of subatomic particle that follows Bose-Einstein statistics, which determine how identical particles with integer spins behave |
| 9. a ri___e of laughter | <i>n.</i> a small wave on the surface of a liquid, typically caused by an object falling into it or a slight wind |
| 10. atmospheric m__n | <i>n.</i> a subatomic particle that is similar to an electron but is about 207 times heavier and is unstable, decaying into other particles after a short time |
| 11. ri___e in the water | <i>n.</i> a small wave on the surface of a liquid, typically caused by an object falling into it or a slight wind |
| 12. enc_____te the essence | <i>v.</i> to enclose or envelop something within a capsule or a membrane; to express or summarize the essence or core of something in a condensed form |
| 13. sterile ne____nos | <i>n.</i> a very small and electrically neutral particle with a very small mass that rarely reacts with other matter |
| 14. low-r_v engine | <i>n.</i> a measure of the rate at which an engine or motor rotates, often expressed in revolutions per minute (RPM); (verb) to increase the number of rotations per minute |
| 15. ann_____te the enemy | <i>v.</i> to destroy completely; to cause something to cease to exist |
| 16. talented ph_____st | <i>n.</i> a scientist who specializes in the field of physics |

ANSWERS: 8. boson, 9. ripple, 10. muon, 11. ripple, 12. encapsulate, 13. neutrino, 14. rev, 15. annihilate, 16. physicist

17. co____e in midair *v.* to hit something violently when moving
18. r_v up the crowd *n.* a measure of the rate at which an engine or motor rotates, often expressed in revolutions per minute (RPM); (verb) to increase the number of rotations per minute
19. pr____n conductivity *n.* a very small particle with a positive charge equal to the negative charge of an electron that forms part of the nucleus of all atoms
20. theoretical ph____st *n.* a scientist who specializes in the field of physics
21. ind____le identity *adj.* unable to be divided or separated; not subject to alteration or change
22. m__n decay *n.* a subatomic particle that is similar to an electron but is about 207 times heavier and is unstable, decaying into other particles after a short time
23. gl__n interaction *n.* a subatomic particle that binds quarks together in the nucleus of an atom, thus mediating the strong nuclear force
24. have a si____g quarrel *n.* a brother or sister; member of a family born to the same parents
25. enc____te the message *v.* to enclose or envelop something within a capsule or a membrane; to express or summarize the essence or core of something in a condensed form
26. ind____le parts *adj.* unable to be divided or separated; not subject to alteration or change

ANSWERS: 17. collide, 18. rev, 19. proton, 20. physicist, 21. indivisible, 22. muon, 23. gluon, 24. sibling, 25. encapsulate, 26. indivisible

27. una_____ble decision *adj.* not able to be explained or justified, often in a way that suggests something suspicious or dishonest is going on; not responsible or answerable for one's actions or behavior
28. play with my si_____gs *n.* a brother or sister; member of a family born to the same parents
29. qu__k physics *n.* a type of elementary particle and a fundamental constituent of matter that make up the heavier elementary particles, such as protons, neutrons, etc.; fresh unripened cheese of a smooth texture made from pasteurized milk, a starter, and rennet
30. una_____ble behavior *adj.* not able to be explained or justified, often in a way that suggests something suspicious or dishonest is going on; not responsible or answerable for one's actions or behavior
31. t_u particle *n.* the 19th letter of the Greek alphabet, transliterated as "t"; (of physics, tau particle) a fundamental particle known as the tau lepton that is an elementary particle with a negative electric charge and a spin of 1/2
32. ann_____te all doubts *v.* to destroy completely; to cause something to cease to exist
33. ant_____er production *n.* matter made up of antiparticles, which have the same mass as regular matter but opposite electrical charges

ANSWERS: 27. unaccountable, 28. sibling, 29. quark, 30. unaccountable, 31. tau, 32. annihilate, 33. antimatter

34. pr___n decay

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

ANSWERS: 34. proton

Session 3: Fill in the Blanks

1. Children often copy their parents or elder _____.
n. a brother or sister; member of a family born to the same parents
2. The search for new _____ particles is one of the most exciting areas of modern physics.
n. a type of subatomic particle that follows Bose-Einstein statistics, which determine how identical particles with integer spins behave
3. Scientists are studying the properties of _____ to gain a deeper understanding of the universe.
n. matter made up of antiparticles, which have the same mass as regular matter but opposite electrical charges
4. He stepped on the gas pedal, and the engine released a loud _____.
n. a measure of the rate at which an engine or motor rotates, often expressed in revolutions per minute (RPM); (verb) to increase the number of rotations per minute
5. The solar wind is composed almost entirely of electrons and _____.
n. a very small particle with a positive charge equal to the negative charge of an electron that forms part of the nucleus of all atoms
6. The movie can _____ the book's spirit, bringing it to life on screen.
v. to enclose or envelop something within a capsule or a membrane; to express or summarize the essence or core of something in a condensed form
7. This laboratory has a pool consisting of thousands of _____ detectors.
n. a very small and electrically neutral particle with a very small mass that rarely reacts with other matter

ANSWERS: 1. siblings, 2. boson, 3. antimatter, 4. rev, 5. protons, 6. encapsulate, 7. neutrino

8. The Big Bang theory states that _____ plasma filled the entire universe before matter as we know it was created.
- n.* a type of elementary particle and a fundamental constituent of matter that make up the heavier elementary particles, such as protons, neutrons, etc.; fresh unripened cheese of a smooth texture made from pasteurized milk, a starter, and rennet
9. The interests of the two countries _____.
- v.* to hit something violently when moving
10. Einstein was an outstanding and famous _____ of the 20th century.
- n.* a scientist who specializes in the field of physics
11. The ____ protein has been found to play a role in the development of Alzheimer's disease and other neurological disorders.
- n.* the 19th letter of the Greek alphabet, transliterated as "t"; (of physics, tau particle) a fundamental particle known as the tau lepton that is an elementary particle with a negative electric charge and a spin of 1/2
12. Many businesses felt the _____ effect of the economy's decline.
- n.* a small wave on the surface of a liquid, typically caused by an object falling into it or a slight wind
13. Cosmic rays consist mostly of protons and _____.
- n.* a subatomic particle that is similar to an electron but is about 207 times heavier and is unstable, decaying into other particles after a short time
14. Liberty and justice for all are _____ concepts.
- adj.* unable to be divided or separated; not subject to alteration or change

ANSWERS: 8. quark-gluon, 9. collide, 10. physicist, 11. tau, 12. ripple, 13. muons, 14. indivisible

15. The _____ disappearance of funds led to an investigation.
adj. not able to be explained or justified, often in a way that suggests something suspicious or dishonest is going on; not responsible or answerable for one's actions or behavior
16. The strong force, mediated by _____ binds protons and neutrons in the atomic nucleus.
n. a subatomic particle that binds quarks together in the nucleus of an atom, thus mediating the strong nuclear force
17. The virus had the potential to _____ entire populations if left unchecked.
v. to destroy completely; to cause something to cease to exist

ANSWERS: 15. unaccountable, 16. gluons, 17. annihilate