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## Vocabulary Builder Reference from...

*Natalya St. Clair: The unexpected math behind Van Gogh's "Starry Night" | TED Talk*

[https://www.ted.com/talks/natalya\\_st\\_clair\\_the\\_unexpected\\_math\\_behind\\_van\\_gogh\\_s\\_starry\\_night](https://www.ted.com/talks/natalya_st_clair_the_unexpected_math_behind_van_gogh_s_starry_night)

### Advanced Words Only

#### IMPORTANT

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## Session 1: Word List

### turbulent

*adj.* marked by a lot of sudden changes, confusion, or uncertainty; characterized by intense activity or agitation

*synonym*: chaotic, stormy, tumultuous

(1) **turbulent** waves, (2) **turbulent** age

The stock market has been **turbulent** lately, with prices fluctuating rapidly.

### germ

*n.* a very tiny living that causes the disease; a piece of something such as an organism, concept, etc., capable of growing into a new one or part of one

*synonym*: bacterium, microbe, pathogen

(1) antibiotic-resistant **germ**, (2) a **germ-free** environment

The **germ** of his idea came from watching birds flying in flocks.

### 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.

### turbulence

*n.* a state of great disturbance, confusion, or uncertainty, often accompanied by violent or disruptive activity or behavior, such as air turbulence during a flight

*synonym*: choppiness, tumult, agitation

(1) financial **turbulence**, (2) emotional **turbulence**

The ride on the rollercoaster was full of dips and turns, creating a feeling of **turbulence**.

## depict

v. to illustrate someone or something in a photograph

*synonym*: illustrate, describe, express

(1) **depict** a scene, (2) **depict** a feeling of isolation

His son had accurately **depicted** the bloom.

## sunrise

n. the time in the morning when the sun first appears in the sky

*synonym*: daybreak, morning, dawn

(1) beautiful **sunrise**, (2) high-technology **sunrise** industries

I got up early to watch the **sunrise** at the summit.

## mutilate

v. to cause severe damage, disfigurement, or injury, usually to a person or an animal; to destroy, alter, or damage something severely or irreparably

*synonym*: maim, disfigure, deform

(1) **mutilate** a document, (2) **mutilate** a body

It is cruel for anyone to **mutilate** an animal for any reason.

## psychotic

adj. relating to or characterized by a loss of touch with reality; exhibiting or suffering from a severe mental disorder characterized by delusions, hallucinations, or disordered thinking

*synonym*: deranged, unstable, certifiable

(1) **psychotic** medication, (2) **psychotic** episode

Her husband's death caused her to experience a **psychotic** break.

## brushstroke

n. the mark or stroke made by a painter's brush on a canvas or surface; a single movement or action toward a larger project or goal

*synonym*: stroke, line, mark

(1) artistic **brushstroke**, (2) a **brushstroke** of genius

The artist made a beautiful **brushstroke** on the canvas.

## swirl

*v.* to move in a circular or spiral pattern

*synonym* : spin, whirl, turn

(1) **swirl** the wine, (2) **swirl** up dirt and dust

The chef expertly **swirled** the sauce onto the plate.

## eddy

*n.* a circular current of water or air that flows in the opposite direction to the main current, causing a small whirlpool; a current of opinion, activity, or trend that goes against the main current

*synonym* : whirlpool, vortex, swirl

(1) **eddy** of water, (2) **eddy** of leaves

Unfortunately, the swirling **eddy** in the river made it difficult to swim.

## impressionism

*n.* a style of art and literature that seeks to capture the fleeting momentary sensations and impressions of perception rather than objective reality or formal structure

(1) **impressionism** movement, (2) **impressionism** style

The famous French painters Monet and Renoir were considered pioneers of **impressionism**.

## dappled

*adj.* marked with spots or patches of different colors or shades; having a mottled or speckled appearance; characterized by a play of light and shadow

*synonym* : spotted, mottled, speckled

(1) **dappled** light, (2) olive- **dappled** landscape

The **dappled** sunlight filtered through the leaves of the trees.

## twinkle

*v.* to shine with a flickering or sparkling light; (noun) the act of shining in a bright and cheerful way

*synonym* : sparkle, shine, glitter

(1) **twinkle** like a star, (2) the **twinkle** of the stars

His eyes **twinkled** with mischief.

## **luminous**

*adj.* emitting or reflecting light, especially in the dark; shining or glowing brightly; full of light or enlightenment

*synonym* : radiant, glowing, brilliant

(1) **luminous** glow, (2) **luminous** stars

The room was filled with **luminous** decorations that shone in the dark.

## **intensify**

*v.* to increase or make something increase in extent or strength

*synonym* : amplify, boost, strengthen

(1) **intensify** diplomatic efforts, (2) **intensify** a good relationship

Rebels have pledged to **intensify** the armed struggle against the dictatorship.

## **primate**

*n.* any mammal of the order Primates, which includes monkeys, apes, and humans

*synonym* : ape, monkey, lemur

(1) **primate** species, (2) **primate** sanctuary

Many scientists study **primate** behavior and intelligence.

## **flicker**

*v.* to shine unsteadily or intermittently, as if with a faint light

*synonym* : flash, spark, glimmer

(1) **flicker** every two seconds, (2) **flicker** out like a candle

The fireflies **flickered** in the darkness.

## **radiate**

*v.* to spread out or emit something, such as light or heat, in all directions

*synonym* : give off, scatter, beam

(1) **radiate** an aura, (2) **radiate** in all directions

Roads **radiate** from the famous building in the center of the city.

## **unsolved**

*adj.* not yet understood, explained, or resolved; remaining a mystery or enigma

*synonym* : unresolved, mysterious, perplexing

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

The case remains **unsolved** after years of investigation.

## **cascade**

*n.* a small waterfall or series of small waterfalls; a succession of stages or operations or processes or units

*synonym* : waterfall, watercourse, step

(1) **cascade** connection, (2) transistor **cascade**

The **cascade** of waterfalls in the national park was a breathtaking sight.

## **Jovian**

*adj.* relating to Jupiter or its characteristics

*synonym* : Jupiter, giant planet

(1) **Jovian** satellites, (2) **Jovian** planet

The **Jovian** moon Europa is believed to have an ocean beneath its icy surface.

## **interstellar**

*adj.* relating to or located in the space between stars

*synonym* : galactic, cosmic, intergalactic

(1) **interstellar** communication, (2) **interstellar** space

The **interstellar** medium comprises gas, dust, and cosmic rays that fill the space between stars.

## **motto**

*n.* a phrase or slogan that expresses a guiding principle or goal

*synonym* : slogan, catchphrase, phrase

(1) the **motto** for safe traffic, (2) company **motto**

The company's **motto** is "Innovation and Service," which is reflected in its products and customer support.

## **agitation**

*n.* a state of anxiety, excitement, or disturbance that is often associated with restlessness, agitation, or nervousness; the act of stirring or moving something in a rapid or erratic manner

*synonym* : excitement, restlessness, turmoil

(1) **agitation** levels, (2) political **agitation**

The crowd's **agitation** grew as the politician failed to answer

their questions.

## **munch**

*v.* to chew or eat something noisily, often with the sound of crunching or crunching

*synonym*: chew, nibble, gnaw

(1) **munch** on an apple, (2) **munch** away on crisps

I love to **munch** on popcorn while I watch a movie.

## **rousing**

*adj.* exciting, stimulating, or inspiring; causing a strong emotional or physical response; arousing enthusiasm or interest

*synonym*: exciting, stirring, invigorating

(1) **rousing** music, (2) **rousing** business

The **rousing** speech by the coach pumped up the team before the big game.

## Session 2: Spelling

1. sw\_\_l up dirt and dust *v.* to move in a circular or spiral pattern
2. Jo\_\_\_n satellites *adj.* relating to Jupiter or its characteristics
3. Jo\_\_\_n planet *adj.* relating to Jupiter or its characteristics
4. pr\_\_\_\_\_e sanctuary *n.* any mammal of the order Primates, which includes monkeys, apes, and humans
5. a bru\_\_\_\_\_ke of genius *n.* the mark or stroke made by a painter's brush on a canvas or surface; a single movement or action toward a larger project or goal
6. in\_\_\_\_\_fy a good relationship *v.* to increase or make something increase in extent or strength
7. pr\_\_\_\_\_e species *n.* any mammal of the order Primates, which includes monkeys, apes, and humans
8. lu\_\_\_\_\_us glow *adj.* emitting or reflecting light, especially in the dark; shining or glowing brightly; full of light or enlightenment
9. tw\_\_\_\_\_e like a star *v.* to shine with a flickering or sparkling light; (noun) the act of shining in a bright and cheerful way
10. un\_\_\_\_\_ed mystery *adj.* not yet understood, explained, or resolved; remaining a mystery or enigma
11. theoretical ph\_\_\_\_\_st *n.* a scientist who specializes in the field of physics

ANSWERS: 1. swirl, 2. Jovian, 3. Jovian, 4. primate, 5. brushstroke, 6. intensify, 7. primate, 8. luminous, 9. twinkle, 10. unsolved, 11. physicist

12. olive-da\_\_\_\_d landscape      *adj.* marked with spots or patches of different colors or shades; having a mottled or speckled appearance; characterized by a play of light and shadow
13. financial tur\_\_\_\_\_ce      *n.* a state of great disturbance, confusion, or uncertainty, often accompanied by violent or disruptive activity or behavior, such as air turbulence during a flight
14. ps\_\_\_\_\_ic medication      *adj.* relating to or characterized by a loss of touch with reality; exhibiting or suffering from a severe mental disorder characterized by delusions, hallucinations, or disordered thinking
15. mu\_\_h on an apple      *v.* to chew or eat something noisily, often with the sound of crunching or crunching
16. mu\_\_\_\_\_te a document      *v.* to cause severe damage, disfigurement, or injury, usually to a person or an animal; to destroy, alter, or damage something severely or irreparably
17. da\_\_\_\_d light      *adj.* marked with spots or patches of different colors or shades; having a mottled or speckled appearance; characterized by a play of light and shadow
18. e\_\_y of water      *n.* a circular current of water or air that flows in the opposite direction to the main current, causing a small whirlpool; a current of opinion, activity, or trend that goes against the main current

ANSWERS: 12. dappled, 13. turbulence, 14. psychotic, 15. munch, 16. mutilate, 17. dappled, 18. eddy



19. mu\_\_\_\_\_te a body *v.* to cause severe damage, disfigurement, or injury, usually to a person or an animal; to destroy, alter, or damage something severely or irreparably
20. ra\_\_\_\_\_e in all directions *v.* to spread out or emit something, such as light or heat, in all directions
21. int\_\_\_\_\_lar space *adj.* relating to or located in the space between stars
22. in\_\_\_\_\_fy diplomatic efforts *v.* to increase or make something increase in extent or strength
23. ps\_\_\_\_\_ic episode *adj.* relating to or characterized by a loss of touch with reality; exhibiting or suffering from a severe mental disorder characterized by delusions, hallucinations, or disordered thinking
24. the mo\_\_o for safe traffic *n.* a phrase or slogan that expresses a guiding principle or goal
25. tu\_\_\_\_\_nt waves *adj.* marked by a lot of sudden changes, confusion, or uncertainty; characterized by intense activity or agitation
26. lu\_\_\_\_\_us stars *adj.* emitting or reflecting light, especially in the dark; shining or glowing brightly; full of light or enlightenment
27. the tw\_\_\_\_\_e of the stars *v.* to shine with a flickering or sparkling light; (noun) the act of shining in a bright and cheerful way
28. ro\_\_\_\_\_g business *adj.* exciting, stimulating, or inspiring; causing a strong emotional or physical response; arousing enthusiasm or interest

ANSWERS: 19. mutilate, 20. radiate, 21. interstellar, 22. intensify, 23. psychotic, 24. motto, 25. turbulent, 26. luminous, 27. twinkle, 28. rousing

29. fl\_\_\_\_r out like a candle *v.* to shine unsteadily or intermittently, as if with a faint light
30. a g\_\_m-free environment *n.* a very tiny living that causes the disease; a piece of something such as an organism, concept, etc., capable of growing into a new one or part of one
31. beautiful su\_\_\_\_e *n.* the time in the morning when the sun first appears in the sky
32. political ag\_\_\_\_on *n.* a state of anxiety, excitement, or disturbance that is often associated with restlessness, agitation, or nervousness; the act of stirring or moving something in a rapid or erratic manner
33. mu\_\_h away on crisps *v.* to chew or eat something noisily, often with the sound of crunching or crunching
34. tu\_\_\_\_nt age *adj.* marked by a lot of sudden changes, confusion, or uncertainty; characterized by intense activity or agitation
35. emotional tur\_\_\_\_ce *n.* a state of great disturbance, confusion, or uncertainty, often accompanied by violent or disruptive activity or behavior, such as air turbulence during a flight
36. company mo\_\_o *n.* a phrase or slogan that expresses a guiding principle or goal
37. transistor ca\_\_\_\_e *n.* a small waterfall or series of small waterfalls; a succession of stages or operations or processes or units
38. int\_\_\_\_lar communication *adj.* relating to or located in the space between stars

ANSWERS: 29. flicker, 30. germ, 31. sunrise, 32. agitation, 33. munch, 34. turbulent, 35. turbulence, 36. motto, 37. cascade, 38. interstellar

39. fl\_\_\_\_r every two seconds      *v.* to shine unsteadily or intermittently, as if with a faint light
40. e\_\_y of leaves      *n.* a circular current of water or air that flows in the opposite direction to the main current, causing a small whirlpool; a current of opinion, activity, or trend that goes against the main current
41. ro\_\_\_\_g music      *adj.* exciting, stimulating, or inspiring; causing a strong emotional or physical response; arousing enthusiasm or interest
42. de\_\_\_\_t a feeling of isolation      *v.* to illustrate someone or something in a photograph
43. antibiotic-resistant g\_\_m      *n.* a very tiny living that causes the disease; a piece of something such as an organism, concept, etc., capable of growing into a new one or part of one
44. imp\_\_\_\_\_\_ism style      *n.* a style of art and literature that seeks to capture the fleeting momentary sensations and impressions of perception rather than objective reality or formal structure
45. high-technology su\_\_\_\_e industries      *n.* the time in the morning when the sun first appears in the sky
46. imp\_\_\_\_\_\_ism movement      *n.* a style of art and literature that seeks to capture the fleeting momentary sensations and impressions of perception rather than objective reality or formal structure
47. artistic bru\_\_\_\_ke      *n.* the mark or stroke made by a painter's brush on a canvas or surface; a single movement or action toward a larger project or goal

ANSWERS: 39. flicker, 40. eddy, 41. rousing, 42. depict, 43. germ, 44. impressionism, 45. sunrise, 46. impressionism, 47. brushstroke

48. talented ph\_\_\_\_\_st *n.* a scientist who specializes in the field of physics
49. sw\_\_l the wine *v.* to move in a circular or spiral pattern
50. de\_\_\_t a scene *v.* to illustrate someone or something in a photograph
51. ca\_\_\_\_\_e connection *n.* a small waterfall or series of small waterfalls; a succession of stages or operations or processes or units
52. ag\_\_\_\_\_on levels *n.* a state of anxiety, excitement, or disturbance that is often associated with restlessness, agitation, or nervousness; the act of stirring or moving something in a rapid or erratic manner
53. ra\_\_\_\_\_e an aura *v.* to spread out or emit something, such as light or heat, in all directions
54. un\_\_\_\_\_ed crime *adj.* not yet understood, explained, or resolved; remaining a mystery or enigma

ANSWERS: 48. physicist, 49. swirl, 50. depict, 51. cascade, 52. agitation, 53. radiate, 54. unsolved

## Session 3: Fill in the Blanks

1. The room was filled with \_\_\_\_\_ decorations that shone in the dark.  
*adj.* emitting or reflecting light, especially in the dark; shining or glowing brightly; full of light or enlightenment
2. Rebels have pledged to \_\_\_\_\_ the armed struggle against the dictatorship.  
*v.* to increase or make something increase in extent or strength
3. I love to \_\_\_\_\_ on popcorn while I watch a movie.  
*v.* to chew or eat something noisily, often with the sound of crunching or crunching
4. His eyes \_\_\_\_\_ with mischief.  
*v.* to shine with a flickering or sparkling light; (noun) the act of shining in a bright and cheerful way
5. The \_\_\_\_\_ moon Europa is believed to have an ocean beneath its icy surface.  
*adj.* relating to Jupiter or its characteristics
6. His son had accurately \_\_\_\_\_ the bloom.  
*v.* to illustrate someone or something in a photograph
7. The \_\_\_\_\_ speech by the coach pumped up the team before the big game.  
*adj.* exciting, stimulating, or inspiring; causing a strong emotional or physical response; arousing enthusiasm or interest
8. The \_\_\_\_\_ of his idea came from watching birds flying in flocks.  
*n.* a very tiny living that causes the disease; a piece of something such as an organism, concept, etc., capable of growing into a new one or part of one

ANSWERS: 1. luminous, 2. intensify, 3. munch, 4. twinkled, 5. Jovian, 6. depicted, 7. rousing, 8. germ

9. The \_\_\_\_\_ of waterfalls in the national park was a breathtaking sight.  
*n.* a small waterfall or series of small waterfalls; a succession of stages or operations or processes or units
10. The stock market has been \_\_\_\_\_ lately, with prices fluctuating rapidly.  
*adj.* marked by a lot of sudden changes, confusion, or uncertainty; characterized by intense activity or agitation
11. Many scientists study \_\_\_\_\_ behavior and intelligence.  
*n.* any mammal of the order Primates, which includes monkeys, apes, and humans
12. Her husband's death caused her to experience a \_\_\_\_\_ break.  
*adj.* relating to or characterized by a loss of touch with reality; exhibiting or suffering from a severe mental disorder characterized by delusions, hallucinations, or disordered thinking
13. I got up early to watch the \_\_\_\_\_ at the summit.  
*n.* the time in the morning when the sun first appears in the sky
14. The case remains \_\_\_\_\_ after years of investigation.  
*adj.* not yet understood, explained, or resolved; remaining a mystery or enigma
15. The artist made a beautiful \_\_\_\_\_ on the canvas.  
*n.* the mark or stroke made by a painter's brush on a canvas or surface; a single movement or action toward a larger project or goal
16. Unfortunately, the swirling \_\_\_\_\_ in the river made it difficult to swim.  
*n.* a circular current of water or air that flows in the opposite direction to the main current, causing a small whirlpool; a current of opinion, activity, or trend that goes against the main current

ANSWERS: 9. cascade, 10. turbulent, 11. primate, 12. psychotic, 13. sunrise, 14. unsolved, 15. brushstroke, 16. eddy

17. The famous French painters Monet and Renoir were considered pioneers of \_\_\_\_\_.
- n.* a style of art and literature that seeks to capture the fleeting momentary sensations and impressions of perception rather than objective reality or formal structure
18. It is cruel for anyone to \_\_\_\_\_ an animal for any reason.
- v.* to cause severe damage, disfigurement, or injury, usually to a person or an animal; to destroy, alter, or damage something severely or irreparably
19. The ride on the rollercoaster was full of dips and turns, creating a feeling of \_\_\_\_\_.
- n.* a state of great disturbance, confusion, or uncertainty, often accompanied by violent or disruptive activity or behavior, such as air turbulence during a flight
20. The company's \_\_\_\_\_ is "Innovation and Service," which is reflected in its products and customer support.
- n.* a phrase or slogan that expresses a guiding principle or goal
21. Einstein was an outstanding and famous \_\_\_\_\_ of the 20th century.
- n.* a scientist who specializes in the field of physics
22. The \_\_\_\_\_ sunlight filtered through the leaves of the trees.
- adj.* marked with spots or patches of different colors or shades; having a mottled or speckled appearance; characterized by a play of light and shadow
23. The crowd's \_\_\_\_\_ grew as the politician failed to answer their questions.
- n.* a state of anxiety, excitement, or disturbance that is often associated with restlessness, agitation, or nervousness; the act of stirring or moving something in a rapid or erratic manner

ANSWERS: 17. impressionism, 18. mutilate, 19. turbulence, 20. motto, 21. physicist, 22. dappled, 23. agitation

24. The fireflies \_\_\_\_\_ in the darkness.

*v.* to shine unsteadily or intermittently, as if with a faint light

25. The \_\_\_\_\_ medium comprises gas, dust, and cosmic rays that fill the space between stars.

*adj.* relating to or located in the space between stars

26. Roads \_\_\_\_\_ from the famous building in the center of the city.

*v.* to spread out or emit something, such as light or heat, in all directions

27. The chef expertly \_\_\_\_\_ the sauce onto the plate.

*v.* to move in a circular or spiral pattern

ANSWERS: 24. flickered, 25. interstellar, 26. radiate, 27. swirled