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## Vocabulary Builder Reference from...

Wajdi Mohamed Ratemi: The mathematical secrets of Pascal's triangle | TED Talk

[https://www.ted.com/talks/wajdi\\_mohamed\\_ratemi\\_the\\_mathematical\\_secrets\\_of\\_pascal\\_s\\_triangle](https://www.ted.com/talks/wajdi_mohamed_ratemi_the_mathematical_secrets_of_pascal_s_triangle)

### Advanced Words Only

#### IMPORTANT

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## Session 1: Word List

### trove

*n.* a valuable collection of rare or interesting things, usually on the earth

*synonym*: hoard, collection, assemblage

(1) **trove** of information, (2) stumble on a **trove**

The treasure **trove** of ancient artifacts was a museum's dream come true.

### staircase

*n.* a set of stairs inside a building, usually with posts and bars that are fixed at the side

*synonym*: stairway, stairwell

(1) spiral **staircase**, (2) beetle up the **staircase**

She walked urgently down the emergency **staircase**.

### yang

*n.* in Chinese philosophy, the masculine or active principle characterized as light and the sun and associated with hardness, dryness, and heat

*synonym*: masculine, positive, active

(1) the **yang** principle, (2) embody **yang** energy

He saw the balance between the yin and **yang** as crucial for a harmonious life.

### intrigue

*v.* to make someone interested, especially by being strange, unusual, or mysterious; to make a secret plan

with other people to harm someone

*synonym* : attract, captivate, charm

(1) **intrigue** him, (2) **intrigue** against his rival

The artist's innovative style of work **intrigues** me.

## binomial

*n.* a mathematical expression or equation consisting of two terms connected by a plus or minus sign; (of biology) a Latin-based scientific name consisting of two words, the genus, and the species

(1) **binomial** distribution, (2) **binomial** theorem

In algebra, we often work with **binomial** expressions to solve equations.

## triangular

*adj.* having three angles or sides; forming or shaped like a triangle (= a three-sided polygon)

*synonym* : three-cornered, trilateral

(1) a **triangular** alliance, (2) **triangular** form

The **triangular** shape of the pyramid was an important architectural feature.

## equilateral

*adj.* characterized by having all sides of equal length, typically used to describe a geometric shape, usually a triangle

*synonym* : equal-sided, regular, isosceles

(1) **equilateral** polygon, (2) **equilateral** shape

An **equilateral** triangle has three equal sides and three equal angles.

## tetragonal

*adj.* of or relating to a crystal system characterized by three axes, two of which are of equal length and perpendicular to a third, longer axis

*synonym* : rectangular, quadrate

(1) **tetragonal** structure, (2) **tetragonal** prism

The **tetragonal** symmetry of the molecule plays an important role in its chemical properties

## tetrahedron

*n.* a solid geometric figure with four triangular faces, typically used in 3d geometry

*synonym* : triangular pyramid, four-faced solid

(1) regular **tetrahedron**, (2) **tetrahedron** molecule

In chemistry and physics, the **tetrahedron** shape describes the geometry of certain molecules and crystals.

## fractal

*n.* a complex geometric pattern or shape that repeats itself on smaller and smaller scales, often occurring in nature or mathematical equations

*synonym* : pattern, design, geometry

(1) **fractal** pattern, (2) **fractal** art

The coastline of Norway is one of the most famous examples of **fractal** geometry in nature.

## probabilistic

*adj.* characterized by the influence of chance or probability; involving the use of statistical models or methods to estimate likelihoods or risks

*synonym* : probable, statistical, likely

(1) **probabilistic** model, (2) **probabilistic** approach

In a **probabilistic** system, the outcome is uncertain and can vary based on chance.

## combinatorics

*n.* a branch of mathematics that deals with counting, arranging, and manipulating the combinations and permutations of elements in a set

*synonym* : combinatorial mathematics, permutation theory

(1) discrete **combinatorics**, (2) applied **combinatorics**

The theory of **combinatorics** has numerous practical applications, including network design and scheduling.

## testament

*n.* a thing that proves the existence or truth of something else

*synonym* : proof, testimony, testimonial

(1) give properties by **testament**, (2) **testament** to the superior quality

His wealth is a **testament** to his success.

## interweave

*v.* to combine or blend substantive parts or elements; to interlace; to mix or intermingle

*synonym*: intertwine, intertwist, interlace

(1) **interweave** threads, (2) **interweave** ideas

The author expertly tried to **interweave** the story's plot and characters.

## 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**.

## Session 2: Spelling

1. int\_\_\_\_\_ve ideas      *v.* to combine or blend substantive parts or elements; to interlace; to mix or intermingle
2. in\_\_\_\_\_ue against his rival      *v.* to make someone interested, especially by being strange, unusual, or mysterious; to make a secret plan with other people to harm someone
3. tet\_\_\_\_\_on molecule      *n.* a solid geometric figure with four triangular faces, typically used in 3d geometry
4. tri\_\_\_\_\_ar form      *adj.* having three angles or sides; forming or shaped like a triangle (= a three-sided polygon)
5. low-r\_v engine      *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
6. the y\_\_g principle      *n.* in Chinese philosophy, the masculine or active principle characterized as light and the sun and associated with hardness, dryness, and heat
7. equ\_\_\_\_\_al shape      *adj.* characterized by having all sides of equal length, typically used to describe a geometric shape, usually a triangle
8. embody y\_\_g energy      *n.* in Chinese philosophy, the masculine or active principle characterized as light and the sun and associated with hardness, dryness, and heat

ANSWERS: 1. interweave, 2. intrigue, 3. tetrahedron, 4. triangular, 5. rev, 6. yang, 7. equilateral, 8. yang

9. pro\_\_\_\_\_tic approach *adj.* characterized by the influence of chance or probability; involving the use of statistical models or methods to estimate likelihoods or risks
10. pro\_\_\_\_\_tic model *adj.* characterized by the influence of chance or probability; involving the use of statistical models or methods to estimate likelihoods or risks
11. beetle up the st\_\_\_\_\_se *n.* a set of stairs inside a building, usually with posts and bars that are fixed at the side
12. tr\_\_e of information *n.* a valuable collection of rare or interesting things, usually on the earth
13. fr\_\_\_\_\_l pattern *n.* a complex geometric pattern or shape that repeats itself on smaller and smaller scales, often occurring in nature or mathematical equations
14. te\_\_\_\_\_nt to the superior quality *n.* a thing that proves the existence or truth of something else
15. 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
16. give properties by te\_\_\_\_\_nt *n.* a thing that proves the existence or truth of something else
17. tet\_\_\_\_\_al prism *adj.* of or relating to a crystal system characterized by three axes, two of which are of equal length and perpendicular to a third, longer axis

ANSWERS: 9. probabilistic, 10. probabilistic, 11. staircase, 12. trove, 13. fractal, 14. testament, 15. rev, 16. testament, 17. tetragonal

18. equ\_\_\_\_\_al polygon *adj.* characterized by having all sides of equal length, typically used to describe a geometric shape, usually a triangle
19. applied com\_\_\_\_\_ics *n.* a branch of mathematics that deals with counting, arranging, and manipulating the combinations and permutations of elements in a set
20. spiral st\_\_\_\_\_se *n.* a set of stairs inside a building, usually with posts and bars that are fixed at the side
21. stumble on a tr\_\_e *n.* a valuable collection of rare or interesting things, usually on the earth
22. int\_\_\_\_\_ve threads *v.* to combine or blend substantive parts or elements; to interlace; to mix or intermingle
23. bi\_\_\_\_\_al distribution *n.* a mathematical expression or equation consisting of two terms connected by a plus or minus sign; (of biology) a Latin-based scientific name consisting of two words, the genus, and the species
24. a tri\_\_\_\_\_ar alliance *adj.* having three angles or sides; forming or shaped like a triangle (= a three-sided polygon)
25. fr\_\_\_\_\_l art *n.* a complex geometric pattern or shape that repeats itself on smaller and smaller scales, often occurring in nature or mathematical equations
26. discrete com\_\_\_\_\_ics *n.* a branch of mathematics that deals with counting, arranging, and manipulating the combinations and permutations of elements in a set

ANSWERS: 18. equilateral, 19. combinatorics, 20. staircase, 21. trove, 22. interweave, 23. binomial, 24. triangular, 25. fractal, 26. combinatorics

27. regular tet\_\_\_\_\_on
- n.* a solid geometric figure with four triangular faces, typically used in 3d geometry
28. bi\_\_\_\_\_al theorem
- n.* a mathematical expression or equation consisting of two terms connected by a plus or minus sign; (of biology) a Latin-based scientific name consisting of two words, the genus, and the species
29. in\_\_\_\_\_ue him
- v.* to make someone interested, especially by being strange, unusual, or mysterious; to make a secret plan with other people to harm someone
30. tet\_\_\_\_\_al structure
- adj.* of or relating to a crystal system characterized by three axes, two of which are of equal length and perpendicular to a third, longer axis

ANSWERS: 27. tetrahedron, 28. binomial, 29. intrigue, 30. tetragonal



## Session 3: Fill in the Blanks

1. The \_\_\_\_\_ shape of the pyramid was an important architectural feature.  
*adj.* having three angles or sides; forming or shaped like a triangle (= a three-sided polygon)
2. He saw the balance between the yin and \_\_\_\_\_ as crucial for a harmonious life.  
*n.* in Chinese philosophy, the masculine or active principle characterized as light and the sun and associated with hardness, dryness, and heat
3. In algebra, we often work with \_\_\_\_\_ expressions to solve equations.  
*n.* a mathematical expression or equation consisting of two terms connected by a plus or minus sign; (of biology) a Latin-based scientific name consisting of two words, the genus, and the species
4. An \_\_\_\_\_ triangle has three equal sides and three equal angles.  
*adj.* characterized by having all sides of equal length, typically used to describe a geometric shape, usually a triangle
5. The artist's innovative style of work \_\_\_\_\_ me.  
*v.* to make someone interested, especially by being strange, unusual, or mysterious; to make a secret plan with other people to harm someone
6. In chemistry and physics, the \_\_\_\_\_ shape describes the geometry of certain molecules and crystals.  
*n.* a solid geometric figure with four triangular faces, typically used in 3d geometry
7. The treasure \_\_\_\_\_ of ancient artifacts was a museum's dream come true.  
*n.* a valuable collection of rare or interesting things, usually on the earth

ANSWERS: 1. triangular, 2. yang, 3. binomial, 4. equilateral, 5. intrigues, 6. tetrahedron, 7. trove

8. She walked urgently down the emergency \_\_\_\_\_.
- n.* a set of stairs inside a building, usually with posts and bars that are fixed at the side
9. The theory of \_\_\_\_\_ has numerous practical applications, including network design and scheduling.
- n.* a branch of mathematics that deals with counting, arranging, and manipulating the combinations and permutations of elements in a set
10. His wealth is a \_\_\_\_\_ to his success.
- n.* a thing that proves the existence or truth of something else
11. In a \_\_\_\_\_ system, the outcome is uncertain and can vary based on chance.
- adj.* characterized by the influence of chance or probability; involving the use of statistical models or methods to estimate likelihoods or risks
12. 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
13. The author expertly tried to \_\_\_\_\_ the story's plot and characters.
- v.* to combine or blend substantive parts or elements; to interlace; to mix or intermingle
14. The coastline of Norway is one of the most famous examples of \_\_\_\_\_ geometry in nature.
- n.* a complex geometric pattern or shape that repeats itself on smaller and smaller scales, often occurring in nature or mathematical equations

ANSWERS: 8. staircase, 9. combinatorics, 10. testament, 11. probabilistic, 12. rev, 13. interweave, 14. fractal

15. The \_\_\_\_\_ symmetry of the molecule plays an important role in its chemical properties

*adj.* of or relating to a crystal system characterized by three axes, two of which are of equal length and perpendicular to a third, longer axis

ANSWERS: 15. tetragonal