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Vocabulary Builder Reference from...

Graham Baird: How do crystals work? | TED Talk

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Advanced Words Only

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Session 1: Word List

geyser

n. a natural hot spring that periodically ejects a column of boiling water and steam into the air; a device that produces a similar effect for decorative or practical purposes

synonym : hot spring, fumarole

(1) erupting **geyser**, (2) Yellowstone **geyser**

The **geyser's** hot water generates electricity for nearby towns and cities.

caldera

n. a large, basin-shaped volcanic crater typically formed by a massive eruption or the collapse of a volcanic cone, often filled with water to form a lake or isolated ecosystem

synonym : volcanic crater, magma chamber

(1) freshwater **caldera**, (2) volcanic **caldera**

The Yellowstone **caldera** is one of the world's largest volcanic craters.

magma

n. molten rock that is located beneath the earth's surface and can solidify to form igneous rock

synonym : molten rock, lava, igneous rock

(1) volcanic **magma**, (2) **magma** flow

Magma chambers are large underground reservoirs where molten rock is stored before an eruption.

mantle

n. a layer of rock between the surface and the core of a planet or moon; a loose sleeveless cloak or shawl; the responsibilities of an important position or job that passes from one person to another

synonym : crust, cloak, cover

(1) **mantle** of power, (2) **mantle** of the presidency

The **mantle** layer on Mars is much thinner than on Earth.

igneous

adj. related to or produced by the process of solidification from a molten state, particularly about rocks or minerals formed by volcanic activity or by cooling and solidification deep within the Earth's crust

synonym : volcanic, magmatic, pyroclastic

(1) **igneous** mineralogy, (2) **igneous** formation

The solidification of molten magma forms **igneous** rocks.

groundwater

n. water that is present beneath the surface of the ground, especially in soil or in pores and crevices in rock

synonym : aquifer, well water, underground water

(1) **groundwater** supply, (2) contaminated **groundwater**

The town's main source of water is natural **groundwater**.

precipitate

v. to cause something to happen suddenly or unexpectedly; to cause a solid substance to form from a dissolved liquid or gas by means of a chemical reaction or physical process

synonym : hasten, accelerate, expedite

(1) **precipitate** a reaction, (2) **precipitate** a global energy crisis

The sudden rainstorm will **precipitate** flooding in low-lying areas.

feldspar

n. a group of minerals that are abundant in the Earth's crust and have a wide range of chemical compositions, often used in the manufacture of ceramics and glass

synonym : mineral, rock, crystal

(1) igneous **feldspar**, (2) sodium **feldspar**

The chemical composition of **feldspar** minerals varies between different geological environments.

galena

n. a mineral that is the primary source of lead, often found in metallic form and used in a variety of applications, including batteries and protective coatings

synonym : mineral, lead ore, sulfide

(1) **galena** crystal, (2) **galena** ore

The **galena** mineral is often used for lead extraction in mining.

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.

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.

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

orthorhombic

adj. describing a crystal system in which the three axes have different lengths and intersect at right angles

(1) **orthorhombic** crystal, (2) **orthorhombic** structure

The mineral has an **orthorhombic** lattice structure with a unit cell that can be described mathematically.

monoclinic

adj. describing a crystal system in which two of the three axes intersect at oblique angles, and the third is perpendicular to them

(1) **monoclinic** system, (2) **monoclinic** mineral

The **monoclinic** shape of the molecule accounts for its unique physical properties.

triclinic

adj. describing a crystal system in which all three axes intersect at oblique angles

(1) **triclinic** symmetry, (2) **triclinic** lattice

The mineral's optical properties are characteristic of the **triclinic** crystal system.

hexagon

n. a six-sided polygon with six angles and six sides of equal length

synonym: hexahedron, six-sided figure, six-gon

(1) **hexagon** head bolt, (2) **hexagon** pattern

The honeycomb structure of a beehive is made up of **hexagons**.

interlocking

adj. fitting or locking together in a way that makes a continuous and secure whole

synonym: connected, linked, joined

(1) **interlocking** braid, (2) **interlocking** mechanism

The **interlocking** puzzle pieces were difficult to separate.

octahedron

n. a geometrical solid or three-dimensional shape with eight equally sized and shaped sides, each forming an equilateral triangle

synonym: eight-sided figure, polyhedron

(1) **octahedron** crystal, (2) interconnected **octahedrons**

The building's design featured an **octahedron-shaped** atrium.

germanium

n. a chemical element with the symbol Ge and atomic number 32, which is a hard and grayish-white metalloid used in a variety of electronic applications, alloys, and as a semiconductor in transistors and other devices

synonym : Ge

(1) **germanium** crystal, (2) **germanium** diode

Germanium-based solar cells are highly efficient and often used in space technology.

sparkle

v. to emit or reflect bright flashes of light, especially with animation and joy

synonym : shine, glimmer, twinkle

(1) **sparkle** like a gem, (2) **sparkle** from receiving light

The diamond **sparkled** in the sunlight.

recognizable

adj. easy to become aware of or identify

synonym : noticeable, perceptible, definite

(1) to a **recognizable** degree, (2) **recognizable** landmark

His car was easily **recognizable** in the parking lot.

crystallize

v. to form crystals from a liquid or solution; to become clear or definite in form or structure; to solidify

synonym : solidify, freeze, shape up

(1) **crystallize** a concept, (2) **crystallize** into reality

As the sugar water cools, it will slowly **crystallize** into rock candy.

turquoise

n. a greenish-blue mineral that is a hydrated copper and aluminum phosphate and is valued as a gemstone, often used in jewelry and decorative objects

synonym : gemstone, aqua, blue-green stone

(1) **turquoise** dress, (2) **turquoise** jewelry

The **turquoise** waters of the Caribbean were a breathtaking sight.

discernible

adj. able to be perceived or recognized; clear or distinguishable

synonym : apparent, noticeable, distinguishable

(1) **discernible** pattern, (2) lack of **discernible** progress

There was a **discernible** change in the atmosphere when the boss walked into the room.

medicinal

adj. of or relating to the treatment or cure of disease

synonym : curative, therapeutic, healing

(1) **medicinal** chemistry, (2) traditional **medicinal**

The **medicinal** properties of this herb have been known to help with various ailments.

Session 2: Spelling

1. tu_____se dress
n. a greenish-blue mineral that is a hydrated copper and aluminum phosphate and is valued as a gemstone, often used in jewelry and decorative objects
2. ge_____um crystal
n. a chemical element with the symbol Ge and atomic number 32, which is a hard and grayish-white metalloid used in a variety of electronic applications, alloys, and as a semiconductor in transistors and other devices
3. int_____ing braid
adj. fitting or locking together in a way that makes a continuous and secure whole
4. sodium fe_____ar
n. a group of minerals that are abundant in the Earth's crust and have a wide range of chemical compositions, often used in the manufacture of ceramics and glass
5. Yellowstone ge____r
n. a natural hot spring that periodically ejects a column of boiling water and steam into the air; a device that produces a similar effect for decorative or practical purposes
6. ca_____e connection
n. a small waterfall or series of small waterfalls; a succession of stages or operations or processes or units
7. cry_____ze into reality
v. to form crystals from a liquid or solution; to become clear or definite in form or structure; to solidify

ANSWERS: 1. turquoise, 2. germanium, 3. interlocking, 4. feldspar, 5. geyser, 6. cascade, 7. crystallize

8. tr_____ic symmetry *adj.* describing a crystal system in which all three axes intersect at oblique angles
9. pre_____te a reaction *v.* to cause something to happen suddenly or unexpectedly; to cause a solid substance to form from a dissolved liquid or gas by means of a chemical reaction or physical process
10. ort_____bic crystal *adj.* describing a crystal system in which the three axes have different lengths and intersect at right angles
11. volcanic ma__a *n.* molten rock that is located beneath the earth's surface and can solidify to form igneous rock
12. dis_____le pattern *adj.* able to be perceived or recognized; clear or distinguishable
13. sp_____e like a gem *v.* to emit or reflect bright flashes of light, especially with animation and joy
14. sp_____e from receiving light *v.* to emit or reflect bright flashes of light, especially with animation and joy
15. interconnected oct_____ons *n.* a geometrical solid or three-dimensional shape with eight equally sized and shaped sides, each forming an equilateral triangle
16. to a rec_____ble degree *adj.* easy to become aware of or identify
17. freshwater ca_____a *n.* a large, basin-shaped volcanic crater typically formed by a massive eruption or the collapse of a volcanic cone, often filled with water to form a lake or isolated ecosystem

ANSWERS: 8. triclinic, 9. precipitate, 10. orthorhombic, 11. magma, 12. discernible, 13. sparkle, 14. sparkle, 15. octahedron, 16. recognizable, 17. caldera

18. traditional me_____al *adj.* of or relating to the treatment or cure of disease
19. volcanic ca_____a *n.* a large, basin-shaped volcanic crater typically formed by a massive eruption or the collapse of a volcanic cone, often filled with water to form a lake or isolated ecosystem
20. ig_____s formation *adj.* related to or produced by the process of solidification from a molten state, particularly about rocks or minerals formed by volcanic activity or by cooling and solidification deep within the Earth's crust
21. contaminated gro_____er *n.* water that is present beneath the surface of the ground, especially in soil or in pores and crevices in rock
22. ma____e of power *n.* a layer of rock between the surface and the core of a planet or moon; a loose sleeveless cloak or shawl; the responsibilities of an important position or job that passes from one person to another
23. rec_____ble landmark *adj.* easy to become aware of or identify
24. gro_____er supply *n.* water that is present beneath the surface of the ground, especially in soil or in pores and crevices in rock
25. mon_____ic system *adj.* describing a crystal system in which two of the three axes intersect at oblique angles, and the third is perpendicular to them

ANSWERS: 18. medicinal, 19. caldera, 20. igneous, 21. groundwater, 22. mantle, 23. recognizable, 24. groundwater, 25. monoclinic

26. ge_____um diode *n.* a chemical element with the symbol Ge and atomic number 32, which is a hard and grayish-white metalloid used in a variety of electronic applications, alloys, and as a semiconductor in transistors and other devices
27. ga___a ore *n.* a mineral that is the primary source of lead, often found in metallic form and used in a variety of applications, including batteries and protective coatings
28. ort_____bic structure *adj.* describing a crystal system in which the three axes have different lengths and intersect at right angles
29. ma__a flow *n.* molten rock that is located beneath the earth's surface and can solidify to form igneous rock
30. tr_____ic lattice *adj.* describing a crystal system in which all three axes intersect at oblique angles
31. 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
32. transistor ca_____e *n.* a small waterfall or series of small waterfalls; a succession of stages or operations or processes or units
33. he_____n pattern *n.* a six-sided polygon with six angles and six sides of equal length
34. int_____ing mechanism *adj.* fitting or locking together in a way that makes a continuous and secure whole

ANSWERS: 26. germanium, 27. galena, 28. orthorhombic, 29. magma, 30. triclinic, 31. tetragonal, 32. cascade, 33. hexagon, 34. interlocking

35. me_____al chemistry *adj.* of or relating to the treatment or cure of disease
36. oct_____on crystal *n.* a geometrical solid or three-dimensional shape with eight equally sized and shaped sides, each forming an equilateral triangle
37. cry_____ne water *adj.* resembling crystal in clarity, transparency, or brilliance; having a highly ordered and symmetrical molecular structure
38. cry_____ze a concept *v.* to form crystals from a liquid or solution; to become clear or definite in form or structure; to solidify
39. erupting ge____r *n.* a natural hot spring that periodically ejects a column of boiling water and steam into the air; a device that produces a similar effect for decorative or practical purposes
40. igneous fe_____ar *n.* a group of minerals that are abundant in the Earth's crust and have a wide range of chemical compositions, often used in the manufacture of ceramics and glass
41. he_____n head bolt *n.* a six-sided polygon with six angles and six sides of equal length
42. 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
43. pre_____te a global energy crisis *v.* to cause something to happen suddenly or unexpectedly; to cause a solid substance to form from a dissolved liquid or gas by means of a chemical reaction or physical process

ANSWERS: 35. medicinal, 36. octahedron, 37. crystalline, 38. crystallize, 39. geyser, 40. feldspar, 41. hexagon, 42. tetragonal, 43. precipitate

44. ga___a crystal *n.* a mineral that is the primary source of lead, often found in metallic form and used in a variety of applications, including batteries and protective coatings
45. cry_____ne structure *adj.* resembling crystal in clarity, transparency, or brilliance; having a highly ordered and symmetrical molecular structure
46. mon_____ic mineral *adj.* describing a crystal system in which two of the three axes intersect at oblique angles, and the third is perpendicular to them
47. ig_____s mineralogy *adj.* related to or produced by the process of solidification from a molten state, particularly about rocks or minerals formed by volcanic activity or by cooling and solidification deep within the Earth's crust
48. tu_____se jewelry *n.* a greenish-blue mineral that is a hydrated copper and aluminum phosphate and is valued as a gemstone, often used in jewelry and decorative objects
49. ma___e of the presidency *n.* a layer of rock between the surface and the core of a planet or moon; a loose sleeveless cloak or shawl; the responsibilities of an important position or job that passes from one person to another

ANSWERS: 44. galena, 45. crystalline, 46. monoclinic, 47. igneous, 48. turquoise, 49. mantle

50. lack of dis_____le progress

adj. able to be perceived or recognized;
clear or distinguishable

ANSWERS: 50. discernible

Session 3: Fill in the Blanks

- _____ solar cells are highly efficient and often used in space technology.
 - a chemical element with the symbol Ge and atomic number 32, which is a hard and grayish-white metalloid used in a variety of electronic applications, alloys, and as a semiconductor in transistors and other devices
- His car was easily _____ in the parking lot.
 - adj.* easy to become aware of or identify
- The _____ hot water generates electricity for nearby towns and cities.
 - a natural hot spring that periodically ejects a column of boiling water and steam into the air; a device that produces a similar effect for decorative or practical purposes
- The mineral has an _____ lattice structure with a unit cell that can be described mathematically.
 - adj.* describing a crystal system in which the three axes have different lengths and intersect at right angles
- The Yellowstone _____ is one of the world's largest volcanic craters.
 - a large, basin-shaped volcanic crater typically formed by a massive eruption or the collapse of a volcanic cone, often filled with water to form a lake or isolated ecosystem
- The _____ of waterfalls in the national park was a breathtaking sight.
 - a small waterfall or series of small waterfalls; a succession of stages or operations or processes or units

ANSWERS: 1. Germanium-based, 2. recognizable, 3. geyser's, 4. orthorhombic, 5. caldera, 6. cascade

7. The _____ puzzle pieces were difficult to separate.
adj. fitting or locking together in a way that makes a continuous and secure whole
8. There was a _____ change in the atmosphere when the boss walked into the room.
adj. able to be perceived or recognized; clear or distinguishable
9. The _____ layer on Mars is much thinner than on Earth.
n. a layer of rock between the surface and the core of a planet or moon; a loose sleeveless cloak or shawl; the responsibilities of an important position or job that passes from one person to another
10. The town's main source of water is natural _____.
n. water that is present beneath the surface of the ground, especially in soil or in pores and crevices in rock
11. The building's design featured an _____ atrium.
n. a geometrical solid or three-dimensional shape with eight equally sized and shaped sides, each forming an equilateral triangle
12. The honeycomb structure of a beehive is made up of _____.
n. a six-sided polygon with six angles and six sides of equal length
13. As the sugar water cools, it will slowly _____ into rock candy.
v. to form crystals from a liquid or solution; to become clear or definite in form or structure; to solidify
14. The _____ properties of this herb have been known to help with various ailments.
adj. of or relating to the treatment or cure of disease

ANSWERS: 7. interlocking, 8. discernible, 9. mantle, 10. groundwater, 11. octahedron-shaped, 12. hexagons, 13. crystallize, 14. medicinal

15. The solidification of molten magma forms _____ rocks.

adj. related to or produced by the process of solidification from a molten state, particularly about rocks or minerals formed by volcanic activity or by cooling and solidification deep within the Earth's crust

16. The mineral's optical properties are characteristic of the _____ crystal system.

adj. describing a crystal system in which all three axes intersect at oblique angles

17. The chemical composition of _____ minerals varies between different geological environments.

n. a group of minerals that are abundant in the Earth's crust and have a wide range of chemical compositions, often used in the manufacture of ceramics and glass

18. 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

19. The diamond _____ in the sunlight.

v. to emit or reflect bright flashes of light, especially with animation and joy

20. 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

21. The _____ mineral is often used for lead extraction in mining.

n. a mineral that is the primary source of lead, often found in metallic form and used in a variety of applications, including batteries and protective coatings

ANSWERS: 15. igneous, 16. triclinic, 17. feldspar, 18. tetragonal, 19. sparkled, 20. crystalline, 21. galena

22. The sudden rainstorm will _____ flooding in low-lying areas.
- v.* to cause something to happen suddenly or unexpectedly; to cause a solid substance to form from a dissolved liquid or gas by means of a chemical reaction or physical process
23. The _____ shape of the molecule accounts for its unique physical properties.
- adj.* describing a crystal system in which two of the three axes intersect at oblique angles, and the third is perpendicular to them
24. The _____ waters of the Caribbean were a breathtaking sight.
- n.* a greenish-blue mineral that is a hydrated copper and aluminum phosphate and is valued as a gemstone, often used in jewelry and decorative objects
25. _____ chambers are large underground reservoirs where molten rock is stored before an eruption.
- n.* molten rock that is located beneath the earth's surface and can solidify to form igneous rock

ANSWERS: 22. precipitate, 23. monoclinic, 24. turquoise, 25. Magma