

Englist.me



Vocabulary Builder Reference from...

Cathy Mulzer: The incredible chemistry powering your smartphone | TED Talk

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

Advanced Words Only

IMPORTANT

This material is a commentary and does not contain any copyrighted material of the reference source. We strongly recommend accessing/buying the reference source at the same time.

Session 1: Word List

waltz

- n.* a ballroom dance in triple time that originated in Vienna and is characterized by a flowing, graceful style and a strong accent on the first beat of each measure

synonym: ballroom dance, tango, foxtrot

- (1) **waltz** music, (2) elegant **waltz**

The dancers practiced the steps of the **waltz** meticulously to perfect their performance.

pretension

- n.* the act of claiming or asserting something, especially without good reason or without evidence; an unfounded or excessive claim or ambition

synonym: presumption, pretense, affectation

- (1) **pretension** to authority, (2) baseless **pretension**

His **pretensions** of being a gourmet were quickly exposed when he could not identify basic herbs and spices.

elf

- n.* a mythical creature typically depicted as a small, mischievous being with pointed ears and magical powers

synonym: sprite, pixie, faerie

- (1) mischievous **elf**, (2) helpful **elf**

I dressed up as an **elf** for the Christmas party.

superhighway

n. a large, wide road designed for high-speed traffic

synonym: expressway, motorway, artery

(1) six-lane **superhighway**, (2) a tollgate of a **superhighway**

The University provides a wireless Internet **superhighway** to its students.

paperweight

n. a small, heavy object, often made of glass or metal, that is designed to hold down papers or other items on a desk or table; an object, usually an electronic device or piece of machinery, that is non-functional or useless for its intended purpose

synonym: desk weight, document holder

(1) metallic **paperweight**, (2) **paperweight** gift

The stained-glass **paperweight** added a pop of color to the desk.

electrify

v. to make a machine or system work by using electricity; to make someone extremely enthusiastic about or interested in something

synonym: wire, amaze, astonish

(1) **electrify** the audience, (2) **electrify** a manufacturing process

The product developed through years of research continues to **electrify** the market.

footprint

n. a mark of a foot, shoe, or animal's foot left on a surface

synonym: footmark, imprint, impression

(1) **footprints** in the snow, (2) the **footprints** of an earlier civilization

We choose transportation that has a smaller carbon **footprint**.

selfie

n. a photograph that one has taken of oneself, typically one taken with a smartphone or webcam to share on social media

synonym: self-portrait, self-photo, self-snap

(1) **selfie** stick, (2) pose for a **selfie**

She took a **selfie** in front of the famous tower and shared it on the app.

recharge

- v. to restore the energy or power of something by supplying it with more energy or power; to refresh or renew oneself by rest or sleep

synonym: renew, refresh, replenish

- (1) **recharge** brain and body, (2) **recharge** energy

He needed to **recharge** his phone before the meeting.

tether

- v. to tie or secure an animal, person, or object with a rope, chain, or other similar devices to prevent it from moving too far away; (noun) a rope or chain used to tie up or restrain an animal, such as a horse or dog

synonym: tie, fasten, secure

- (1) **tether** a horse, (2) **tether** strap

The hiker **tethered** their dog to a tree while they camped for the night.

motherboard

- n. the main circuit board in a computer or other electronic device that contains the central processing unit (CPU), memory, and other essential components that allow the device to function

synonym: mainboard

- (1) **motherboard** upgrade, (2) faulty **motherboard**

The performance of a computer largely depends on the quality of the **motherboard**.

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.

capacitor

- n.* a device that is placed inside electronic equipment such as televisions and radios and that stores electrical charge

synonym: condenser

(1) **capacitor** load, (2) AC **capacitor**

Hundreds of ceramic **capacitors** are used in a single smartphone.

spool

- n.* a cylindrical device with a flange at one or both ends, containing a hollow center and used to wind or store wire, thread, tape, film, or other flexible materials

synonym: bobbin, reel, cylinder

(1) **spool** pin, (2) **spool** of tape

I need a new **spool** of thread for my sewing machine.

posit

- v.* to suggest or accept something as fact or as a basis for argument or consideration

synonym: assert, declare, assume

(1) **posit** the existence of life after death, (2) **posit** the premise

We should **posit** several hypotheses to discuss the matter.

insulate

- v.* to protect something by interposing material that prevents heat, noise, electricity, etc.

synonym: isolate, protect, seclude

(1) **insulate** the room from sound, (2) **insulate** electricity

We had our bedroom **insulated** before winter came.

formaldehyde

- n.* a colorless, flammable liquid with a strong, pungent smell used as a preservative and in the manufacture of various products

synonym: methanal

(1) **formaldehyde** solution, (2) **formaldehyde** odor

Exposure to high levels of **formaldehyde** can irritate the eyes, nose, and throat, as well as respiratory problems and cancer.

redox

- n.* a chemical reaction in which there is a transfer of electrons from one molecule to another, resulting in a change in the oxidation state (or degree of electron loss or gain) of one or more atoms

synonym : oxidation-reduction, electron transfer

- (1) **redox** reaction, (2) **redox** equilibrium

In a **redox** process, one substance gains electrons while another loses them.

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**.

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.

lithograph

- n.* a printmaking process that involves creating a design on a flat stone or metal plate, transferring the design to paper using ink, and then printing multiple copies of the design

synonym : print, etching, engraving

- (1) **lithograph** print, (2) limited edition **lithograph**

The art gallery showcased a collection of colorful **lithographic** prints by renowned artists.

cram

- v.* to force or try to fit a large amount of information into a short time, especially in preparation for an examination; to force or try to fit a large amount of something into a small space

synonym : stuff, pack, jam

- (1) **cram** more circuits into chips, (2) **cram** five people into a

car

She had to **cram** for the final exam and stayed up all night studying.

excite

v. to make someone feel suddenly enthusiastic or eager
synonym: thrill, exhilarate, animate

(1) **excite** the crowd, (2) **excite** rebellion

The news of her promotion **excited** her.

app

n. (abbreviation for application) software designed to run on smartphones and other mobile devices or inside a web browser on a PC

synonym: application, software

(1) killer **app**, (2) cannot log in to the **app**

The discovery of a critical bug caused the company to delay the **app's** release.

nook

n. a small corner, alcove, or recess, especially one in a room or garden providing a seat or space for quiet

synonym: niche, corner, alcove

(1) every **nook** and cranny, (2) breakfast **nook**

The kitchen **nook** was perfect for coffee and chatting with friends.

cranny

n. a small, narrow opening or crack, especially in a wall or rock

synonym: crevice, nook, niche

(1) a **cranny** in the corner, (2) look in every nook and **cranny**

The mouse squeezed into the tiniest **cranny** of the wall to avoid being caught by the cat.

latch

n. a device for holding a door or gate closed, typically a sliding bar or bolt

synonym: lock, catch, bolt

(1) set the **latch**, (2) **latch** mechanism

The **latch** on the gate was broken, so the cows got loose.

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.

adhesion

n. the action or process of sticking to something; the physical force that holds surfaces together, especially in the case of two different materials that are in contact with each other

synonym: bonding, stickiness, constancy

(1) **adhesion** strength, (2) chemical **adhesion**

The **adhesion** of the duct tape to the surface was surprisingly strong.

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.

skyrocket

v. to rapidly ascend to a very high level; increase rapidly;

synonym: rocket, soar, shoot up

(1) **skyrocket** the cost, (2) price **skyrocketed**

Production has decreased, but costs and unemployment have **skyrocketed** dramatically.

sidekick

n. a person who is closely associated with and supports another person, especially in a work or professional capacity; a person who is a close and loyal companion

synonym: companion, helper, ally

(1) a detective's **sidekick**, (2) his best friend's **sidekick**

The superhero's **sidekick** was always there to help him.

Session 2: Spelling

- | | |
|--|---|
| 1. the fo_____nts of an earlier civilization | <i>n.</i> a mark of a foot, shoe, or animal's foot left on a surface |
| 2. mi____n measurements | <i>n.</i> a unit of measurement equal to one-millionth of a meter, used for measuring the size of particles and microorganisms |
| 3. el_____fy a manufacturing process | <i>v.</i> to make a machine or system work by using electricity; to make someone extremely enthusiastic about or interested in something |
| 4. breakfast n__k | <i>n.</i> a small corner, alcove, or recess, especially one in a room or garden providing a seat or space for quiet |
| 5. el_____fy the audience | <i>v.</i> to make a machine or system work by using electricity; to make someone extremely enthusiastic about or interested in something |
| 6. set the la__h | <i>n.</i> a device for holding a door or gate closed, typically a sliding bar or bolt |
| 7. ex____e rebellion | <i>v.</i> to make someone feel suddenly enthusiastic or eager |
| 8. mischievous e_f | <i>n.</i> a mythical creature typically depicted as a small, mischievous being with pointed ears and magical powers |
| 9. re_____ge energy | <i>v.</i> to restore the energy or power of something by supplying it with more energy or power; to refresh or renew oneself by rest or sleep |

ANSWERS: 1. footprint, 2. micron, 3. electrify, 4. nook, 5. electrify, 6. latch, 7. excite, 8. elf, 9. recharge

- | | |
|------------------------------------|--|
| 10. AC ca_____or | <i>n.</i> a device that is placed inside electronic equipment such as televisions and radios and that stores electrical charge |
| 11. for_____yde odor | <i>n.</i> a colorless, flammable liquid with a strong, pungent smell used as a preservative and in the manufacture of various products |
| 12. helpful e_f | <i>n.</i> a mythical creature typically depicted as a small, mischievous being with pointed ears and magical powers |
| 13. lit_____ph print | <i>n.</i> a printmaking process that involves creating a design on a flat stone or metal plate, transferring the design to paper using ink, and then printing multiple copies of the design |
| 14. look in every nook and cr___y | <i>n.</i> a small, narrow opening or crack, especially in a wall or rock |
| 15. c___m more circuits into chips | <i>v.</i> to force or try to fit a large amount of information into a short time, especially in preparation for an examination; to force or try to fit a large amount of something into a small space |
| 16. a tollgate of a sup_____way | <i>n.</i> a large, wide road designed for high-speed traffic |
| 17. re__x reaction | <i>n.</i> a chemical reaction in which there is a transfer of electrons from one molecule to another, resulting in a change in the oxidation state (or degree of electron loss or gain) of one or more atoms |
| 18. pre_____on to authority | <i>n.</i> the act of claiming or asserting something, especially without good reason or without evidence; an unfounded or excessive claim or ambition |

ANSWERS: 10. capacitor, 11. formaldehyde, 12. elf, 13. lithograph, 14. cranny, 15. cram, 16. superhighway, 17. redox, 18. pretension

- | | |
|--------------------------------|--|
| 19. things at the na_____le | <i>adj.</i> on a scale that can be measured in nanometres (= one billionth of a meter); on a very small scale |
| 20. re_____ge brain and body | <i>v.</i> to restore the energy or power of something by supplying it with more energy or power; to refresh or renew oneself by rest or sleep |
| 21. sp__l of tape | <i>n.</i> a cylindrical device with a flange at one or both ends, containing a hollow center and used to wind or store wire, thread, tape, film, or other flexible materials |
| 22. fo_____nts in the snow | <i>n.</i> a mark of a foot, shoe, or animal's foot left on a surface |
| 23. metallic pap_____ht | <i>n.</i> a small, heavy object, often made of glass or metal, that is designed to hold down papers or other items on a desk or table; an object, usually an electronic device or piece of machinery, that is non-functional or useless for its intended purpose |
| 24. every n__k and cranny | <i>n.</i> a small corner, alcove, or recess, especially one in a room or garden providing a seat or space for quiet |
| 25. limited edition lit_____ph | <i>n.</i> a printmaking process that involves creating a design on a flat stone or metal plate, transferring the design to paper using ink, and then printing multiple copies of the design |
| 26. ind_____us worker | <i>adj.</i> hardworking, diligent, and persistent in effort |

ANSWERS: 19. nanoscale, 20. recharge, 21. spool, 22. footprint, 23. paperweight, 24. nook, 25. lithograph, 26. industrious

- | | |
|--------------------------------|---|
| 27. his best friend's si____ck | <i>n.</i> a person who is closely associated with and supports another person, especially in a work or professional capacity; a person who is a close and loyal companion |
| 28. in____te electricity | <i>v.</i> to protect something by interposing material that prevents heat, noise, electricity, etc. |
| 29. la__h mechanism | <i>n.</i> a device for holding a door or gate closed, typically a sliding bar or bolt |
| 30. baseless pre____on | <i>n.</i> the act of claiming or asserting something, especially without good reason or without evidence; an unfounded or excessive claim or ambition |
| 31. cannot log in to the a_p | <i>n.</i> (abbreviation for application) software designed to run on smartphones and other mobile devices or inside a web browser on a PC |
| 32. six-lane sup____way | <i>n.</i> a large, wide road designed for high-speed traffic |
| 33. pose for a se____e | <i>n.</i> a photograph that one has taken of oneself, typically one taken with a smartphone or webcam to share on social media |
| 34. na____le device | <i>adj.</i> on a scale that can be measured in nanometres (= one billionth of a meter); on a very small scale |
| 35. se____e stick | <i>n.</i> a photograph that one has taken of oneself, typically one taken with a smartphone or webcam to share on social media |

ANSWERS: 27. sidekick, 28. insulate, 29. latch, 30. pretension, 31. app, 32. superhighway, 33. selfie, 34. nanoscale, 35. selfie

- | | |
|---|--|
| 36. ca_____or load | <i>n.</i> a device that is placed inside electronic equipment such as televisions and radios and that stores electrical charge |
| 37. for_____yde solution | <i>n.</i> a colorless, flammable liquid with a strong, pungent smell used as a preservative and in the manufacture of various products |
| 38. talented ph_____st | <i>n.</i> a scientist who specializes in the field of physics |
| 39. po__t the premise | <i>v.</i> to suggest or accept something as fact or as a basis for argument or consideration |
| 40. po__t the existence of life after death | <i>v.</i> to suggest or accept something as fact or as a basis for argument or consideration |
| 41. te___r strap | <i>v.</i> to tie or secure an animal, person, or object with a rope, chain, or other similar devices to prevent it from moving too far away; (noun) a rope or chain used to tie up or restrain an animal, such as a horse or dog |
| 42. tra_____or radio | <i>n.</i> a semiconductor device that can be used to amplify or switch electronic signals and power which is an essential component in modern electronics |
| 43. chemical ad_____on | <i>n.</i> the action or process of sticking to something; the physical force that holds surfaces together, especially in the case of two different materials that are in contact with each other |

ANSWERS: 36. capacitor, 37. formaldehyde, 38. physicist, 39. posit, 40. posit, 41. tether, 42. transistor, 43. adhesion

- | | |
|-----------------------|--|
| 44. elegant wa__z | <i>n.</i> a ballroom dance in triple time that originated in Vienna and is characterized by a flowing, graceful style and a strong accent on the first beat of each measure |
| 45. sp__l pin | <i>n.</i> a cylindrical device with a flange at one or both ends, containing a hollow center and used to wind or store wire, thread, tape, film, or other flexible materials |
| 46. faulty mot____rd | <i>n.</i> the main circuit board in a computer or other electronic device that contains the central processing unit (CPU), memory, and other essential components that allow the device to function |
| 47. mot____rd upgrade | <i>n.</i> the main circuit board in a computer or other electronic device that contains the central processing unit (CPU), memory, and other essential components that allow the device to function |
| 48. mi___n imaging | <i>n.</i> a unit of measurement equal to one-millionth of a meter, used for measuring the size of particles and microorganisms |
| 49. killer a_p | <i>n.</i> (abbreviation for application) software designed to run on smartphones and other mobile devices or inside a web browser on a PC |
| 50. price sk____eted | <i>v.</i> to rapidly ascend to a very high level; increase rapidly; |
| 51. te___r a horse | <i>v.</i> to tie or secure an animal, person, or object with a rope, chain, or other similar devices to prevent it from moving too far away; (noun) a rope or chain used to tie up or restrain an animal, such as a horse or dog |

ANSWERS: 44. waltz, 45. spool, 46. motherboard, 47. motherboard, 48. micron, 49. app, 50. skyrocket, 51. tether

52. pap_____ht gift *n.* a small, heavy object, often made of glass or metal, that is designed to hold down papers or other items on a desk or table; an object, usually an electronic device or piece of machinery, that is non-functional or useless for its intended purpose
53. wa__z music *n.* a ballroom dance in triple time that originated in Vienna and is characterized by a flowing, graceful style and a strong accent on the first beat of each measure
54. a detective's si_____ck *n.* a person who is closely associated with and supports another person, especially in a work or professional capacity; a person who is a close and loyal companion
55. theoretical ph_____st *n.* a scientist who specializes in the field of physics
56. 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
57. ad_____on strength *n.* the action or process of sticking to something; the physical force that holds surfaces together, especially in the case of two different materials that are in contact with each other
58. ind_____us student *adj.* hardworking, diligent, and persistent in effort

ANSWERS: 52. paperweight, 53. waltz, 54. sidekick, 55. physicist, 56. transistor, 57. adhesion, 58. industrious

- | | |
|-----------------------------------|--|
| 59. re__x equilibrium | <i>n.</i> a chemical reaction in which there is a transfer of electrons from one molecule to another, resulting in a change in the oxidation state (or degree of electron loss or gain) of one or more atoms |
| 60. c__m five people into a car | <i>v.</i> to force or try to fit a large amount of information into a short time, especially in preparation for an examination; to force or try to fit a large amount of something into a small space |
| 61. a cr___y in the corner | <i>n.</i> a small, narrow opening or crack, especially in a wall or rock |
| 62. sk_____et the cost | <i>v.</i> to rapidly ascend to a very high level; increase rapidly; |
| 63. ex___e the crowd | <i>v.</i> to make someone feel suddenly enthusiastic or eager |
| 64. in_____te the room from sound | <i>v.</i> to protect something by interposing material that prevents heat, noise, electricity, etc. |

ANSWERS: 59. redox, 60. cram, 61. cranny, 62. skyrocket, 63. excite, 64. insulate

Session 3: Fill in the Blanks

1. The University provides a wireless Internet _____ to its students.
n. a large, wide road designed for high-speed traffic
2. The news of her promotion _____ her.
v. to make someone feel suddenly enthusiastic or eager
3. The performance of a computer largely depends on the quality of the _____.
n. the main circuit board in a computer or other electronic device that contains the central processing unit (CPU), memory, and other essential components that allow the device to function
4. The discovery of a critical bug caused the company to delay the _____ release.
n. (abbreviation for application) software designed to run on smartphones and other mobile devices or inside a web browser on a PC
5. The kitchen _____ was perfect for coffee and chatting with friends.
n. a small corner, alcove, or recess, especially one in a room or garden providing a seat or space for quiet
6. 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
7. The _____ of the duct tape to the surface was surprisingly strong.
n. the action or process of sticking to something; the physical force that holds surfaces together, especially in the case of two different materials that are in contact with each other

ANSWERS: 1. superhighway, 2. excited, 3. motherboard, 4. app's, 5. nook, 6. nanoscale, 7. adhesion

8. She took a _____ in front of the famous tower and shared it on the app.
- n.* a photograph that one has taken of oneself, typically one taken with a smartphone or webcam to share on social media
9. He needed to _____ his phone before the meeting.
- v.* to restore the energy or power of something by supplying it with more energy or power; to refresh or renew oneself by rest or sleep
10. Hundreds of ceramic _____ are used in a single smartphone.
- n.* a device that is placed inside electronic equipment such as televisions and radios and that stores electrical charge
11. His _____ of being a gourmet were quickly exposed when he could not identify basic herbs and spices.
- n.* the act of claiming or asserting something, especially without good reason or without evidence; an unfounded or excessive claim or ambition
12. The _____ on the gate was broken, so the cows got loose.
- n.* a device for holding a door or gate closed, typically a sliding bar or bolt
13. 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
14. In a _____ process, one substance gains electrons while another loses them.
- n.* a chemical reaction in which there is a transfer of electrons from one molecule to another, resulting in a change in the oxidation state (or degree of electron loss or gain) of one or more atoms
15. Einstein was an outstanding and famous _____ of the 20th century.
- n.* a scientist who specializes in the field of physics

ANSWERS: 8. selfie, 9. recharge, 10. capacitors, 11. pretensions, 12. latch, 13. transistor, 14. redox, 15. physicist

16. I dressed up as an ____ for the Christmas party.

- n.* a mythical creature typically depicted as a small, mischievous being with pointed ears and magical powers

17. Exposure to high levels of _____ can irritate the eyes, nose, and throat, as well as respiratory problems and cancer.

- n.* a colorless, flammable liquid with a strong, pungent smell used as a preservative and in the manufacture of various products

18. We had our bedroom _____ before winter came.

- v.* to protect something by interposing material that prevents heat, noise, electricity, etc.

19. The superhero's _____ was always there to help him.

- n.* a person who is closely associated with and supports another person, especially in a work or professional capacity; a person who is a close and loyal companion

20. The mouse squeezed into the tiniest _____ of the wall to avoid being caught by the cat.

- n.* a small, narrow opening or crack, especially in a wall or rock

21. Production has decreased, but costs and unemployment have _____ dramatically.

- v.* to rapidly ascend to a very high level; increase rapidly;

22. We should _____ several hypotheses to discuss the matter.

- v.* to suggest or accept something as fact or as a basis for argument or consideration

ANSWERS: 16. elf, 17. formaldehyde, 18. insulated, 19. sidekick, 20. cranny, 21. skyrocketed, 22. posit

23. The dancers practiced the steps of the _____ meticulously to perfect their performance.
- n.* a ballroom dance in triple time that originated in Vienna and is characterized by a flowing, graceful style and a strong accent on the first beat of each measure
24. The product developed through years of research continues to _____ the market.
- v.* to make a machine or system work by using electricity; to make someone extremely enthusiastic about or interested in something
25. The hiker _____ their dog to a tree while they camped for the night.
- v.* to tie or secure an animal, person, or object with a rope, chain, or other similar devices to prevent it from moving too far away; (noun) a rope or chain used to tie up or restrain an animal, such as a horse or dog
26. She had to _____ for the final exam and stayed up all night studying.
- v.* to force or try to fit a large amount of information into a short time, especially in preparation for an examination; to force or try to fit a large amount of something into a small space
27. 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
28. The stained-glass _____ added a pop of color to the desk.
- n.* a small, heavy object, often made of glass or metal, that is designed to hold down papers or other items on a desk or table; an object, usually an electronic device or piece of machinery, that is non-functional or useless for its intended purpose

ANSWERS: 23. waltz, 24. electrify, 25. tethered, 26. cram, 27. microns, 28. paperweight

29. We choose transportation that has a smaller carbon _____.

n. a mark of a foot, shoe, or animal's foot left on a surface

30. The art gallery showcased a collection of colorful _____ prints by renowned artists.

n. a printmaking process that involves creating a design on a flat stone or metal plate, transferring the design to paper using ink, and then printing multiple copies of the design

31. I need a new _____ of thread for my sewing machine.

n. a cylindrical device with a flange at one or both ends, containing a hollow center and used to wind or store wire, thread, tape, film, or other flexible materials

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

adj. hardworking, diligent, and persistent in effort

ANSWERS: 29. footprint, 30. lithographic, 31. spool, 32. industrious