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Peter Weinstock: Lifelike simulations that make real-life surgery safer | TED Talk https://www.ted.com/talks/peter_weinstock_lifelike_si mulations_that_make_real_life_surgery_safer



Advanced Words Only

IMPORTANT

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Session 1: Word List

improvisation

- the act of making something up on the spot or creating or performing something without preparation
- synonym: spontaneity, ad-lib, extemporization
- (1) **improvisation** on stage, (2) jazz **improvisation** He created a beautiful piece of music using only **improvisation**.

anesthetic

- a substance that is administered to a person or an animal to produce a loss of sensation or consciousness so that medical or surgical procedures can be performed without causing pain
- synonym: sedative, anesthesia, painkiller
- (1) anesthetic injection, (2) local anesthetic

The dentist administered an **anesthetic** to numb the patient's mouth before the procedure.

lifelike

- adj. resembling or appearing similar to something alive or real, often realistically or vividly; convincing or authentic in appearance or behavior
- synonym: realistic, naturalistic, vivid
- (1) **lifelike** painting, (2) **lifelike** animation

The artist created a **lifelike** sculpture of a famous politician for the town square.

rehearsal

 a practice session, usually for a performance or presentation, during which people prepare and fine-tune their performance, often with the help of feedback from others; the act of rehearsing

synonym: practice, run-through, drill

(1) dress rehearsal, (2) music rehearsal

The theater company had its final **rehearsal** before opening night.

deteriorate

- v. to become worse in quality; to decline or degenerate synonym: decline, degenerate, regress
- (1) **deteriorate** at a slow pace, (2) **deteriorate** condition The patient's health **deteriorated** rapidly after being diagnosed with the disease.

abdomen

n. the part of the body between the chest and pelvis that contains the stomach, intestines, liver, pancreas, and other organs; the posterior part of an insect's body, typically divided into segments

synonym: belly, gut, tummy

(1) abdomen pain, (2) insect abdomen

The weightlifter used his strong **abdomen** muscles to lift the heavy barbell.

intestine

 a long, tube-like organ in the digestive system that is responsible for absorbing nutrients from food and eliminating waste products

synonym: gut, bowel, tract

(1) large intestine, (2) intestine wall

The small **intestine** is responsible for absorbing most of the nutrients from food.

translucent

 adj. allowing light to pass through but scattering it so that objects behind cannot be seen clearly; partially transparent

synonym: semi-transparent, see-through

(1) translucent glass, (2) translucent skin

The sunlight shone through the **translucent** curtains, casting a warm glow in the room.

whisk

- v. to move something somewhere suddenly and quickly synonym: whip, hasten, wipe
- (1) **whisk** flies away, (2) **whisk** people from entrance to exit **Whisk** rapidly until egg whites are foamy.

incision

 a sharp cut made in something with a sharp tool, especially during a medical procedure

synonym: cut, slit, laceration

(1) incision tool, (2) small incision

Patients undergoing **incisional** surgery are often put to sleep by anesthesia.

catheter

 a thin, flexible tube that is inserted into a body cavity, duct, or vessel to drain fluid, inject medication, or perform a medical procedure

synonym: tube, drainage tube, pipe

(1) insert catheter, (2) urinary catheter

After the surgery, the patient was required to wear a **catheter** for several days.

congenital

- adj. existing from birth; often used to describe a condition or trait that is inherited or present from the moment of birth synonym: innate, inborn, inherent
- congenital disease, (2) congenital disorder
 Congenital heart defects can often be diagnosed before a baby is born.

diaphragm

n. a large, dome-shaped muscle located at the bottom of the chest cavity, essential for breathing and separating the chest and abdomen; a shallow, dome-shaped device with a flexible rim that is inserted into the vagina to cover the cervix and prevent sperm from reaching the uterus, serving as a method of birth control

synonym: midriff, pessary, shield

(1) diaphragm birth control,	(2) diaphragm activity
Individuals with a weak diaph	nragm may experience difficulty
breathing during physical acti	vity.

hernia

a medical condition characterized by the protrusion of an organ or tissue through an opening or weak spot in the abdominal wall or muscles; a bulge or swelling caused by the herniation of organs or tissues

synonym: bulge, rupture, prolapse

(1) hernia surgery, (2) umbilical hernia

The man's hiatal **hernia** caused him to suffer from heartburn and acid reflux.

sneak

to go somewhere, or take someone or something somewhere secretly or stealthily; to steal or do something secretly or stealthily

synonym: creep, tiptoe, smuggle

(1) **sneak** a cigarette, (2) **sneak** out of danger The children tried to **sneak** out and eat the candy.

apprentice

- a person who works for and learns from a skilled employer to become a skilled worker themselves synonym: learner, trainee, protégé
- (1) apprentice carpenter, (2) a young apprentice He took on an **apprentice** to teach him the trade.

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.

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.

fuselage

 the main body of an aircraft, including the cockpit, passenger compartments, and cargo holds

synonym: body, frame, chassis

(1) aluminum fuselage, (2) long fuselage

The airplane's **fuselage** was damaged in the emergency landing.

evacuate

v. to remove people or things from a place of danger or threat; to leave or abandon a place or situation, often due to fear or risk

synonym: empty, clear out, vacate

(1) **evacuate** the building, (2) **evacuate** civilians

The town was forced to **evacuate** due to the hurricane approaching.

dime

- an American or Canadian coin worth one-tenth of a dollar
- (1) dime store, (2) behind a dime

He never received a **dime**, even from the company of a close friend.

limber

v. to make or become more flexible, particularly with exercise or stretching; to prepare oneself mentally or physically for a task or activity

synonym: stretch, warm up, flex

(1) **limber** up with some stretching exercises, (2) **limber** my body

You need to **limber** up before starting to exercise to prevent injury.

phenomenal

adj. extremely good or impressive; outstanding synonym: extraordinary, remarkable, impressive

(1) **phenomenal** success, (2) **phenomenal** growth

The athlete's **phenomenal** performance broke all previous

records.

batter

- v. to hit something or someone repeatedly with much force; (noun, baseball) a ballplayer who is battingsynonym: beat, pound, strike
- (1) batter the eggs, (2) the batter's boxHe got so angry that he battered the door down.

neurology

- n. the branch of medicine that deals with the diagnosis and treatment of disorders of the nervous systemsynonym: brain science, nervous system, neuropathology
- (1) cognitive **neurology**, (2) **neurology** department She is studying clinical **neurology** to become a brain surgeon.

hydrocephalus

n. a condition in which cerebrospinal fluid (= a clear, colorless fluid that circulates in and around the brain and spinal cord) accumulates in the ventricles of the brain, causing pressure and enlargement of the head; a congenital condition or one that can develop as a result of injury or illness

synonym: water on the brain, cranial swelling

(1) **hydrocephalus** treatment, (2) congenital **hydrocephalus**

The symptoms of **hydrocephalus** include headaches, nausea, and blurred vision.

neurosurgery

- medical operations conducted on the nervous system, including the brain, spinal cord, and individual nerves
- (1) the department of **neurosurgery**, (2) specialize in **neurosurgery**

She has 20 years of experience in **neurosurgery**.

cerebrospinal

- adj. relating to the brain and spinal cord
- (1) **cerebrospinal** fluid, (2) **cerebrospinal** pathway The **cerebrospinal** nerves carry messages between the brain and the rest of the body.

pinhole

 a tiny hole in a material, often made by a needle, that allows light or other substances to pass through

synonym: aperture, perforation, pore

(1) pinhole image, (2) pinhole leak

The camera's **pinhole** lens creates a unique blur effect in photographs.

tweeze

v. to pluck or remove hairs, particularly from the face or other sensitive areas, using a pair of tweezers (= a small hand-held tool used for grasping and manipulating small objects with precision) or other specialized tools

synonym: pluck, pull out, extract

(1) **tweeze** unwanted hair, (2) **tweeze** hairs She carefully **tweezed** the stray eyebrow hairs.

rudimentary

adj. relating to basic facts or principles; fundamental *synonym*: essential, fundamental, elementary

(1) a **rudimentary** plant, (2) **rudimentary** understanding He has only a **rudimentary** knowledge of this topic.

rehearse

v. to practice or repeat something, such as a performance, speech, or action, to prepare for an event or to improve one's skills; to go through the motions of a planned activity before executing it

synonym: practice, recite, drill

(1) **rehearse** an opera, (2) **rehearse** a speech The actors needed to **rehearse** their lines before the performance.

animate

- v. to make something full of interest and energy synonym: invigorate, energize, enliven
- (1) **animate** the body, (2) **animate** his soul The positive attitude of the supervisor **animated** the discussion.

micron

 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.

recreate

v. to make something that existed previously happen or appear to exist again

synonym: renovate, vivify, revive

(1) **recreate** a single country, (2) **recreate** the feeling of the 1920s

She **recreated** the atmosphere of the pre-war age with her stage setting.

cinematograph

 an early motion picture projector invented by the French Lumière brothers, often used to refer to early cinema in general

synonym: movie camera, film projector, motion picture

(1) **cinematograph** camera, (2) silent **cinematograph** film Early silent movies were projected using a hand-cranked **cinematograph**.

filmmaking

- n. the process or art of making moviessynonym: movie-making, film production, cinema
- (1) **filmmaking** industry, (2) retire from **filmmaking**The history of **filmmaking** dates back to the late 19th century when motion pictures were first shown to audiences.

fused

- adj. joined together or combined into one; blended or integrated in a way that creates a new entitysynonym: merged, blended, united
- (1) fused glass, (2) fused bones

The **fused** wires in the electrical circuit caused a power outage.

queasy

adj. feeling or causing discomfort or unease, especially about one's stomach; nauseated or sick; squeamish or

easily made to feel unsettled or anxious

synonym: nauseous, unsettled, noisome

(1) queasy stomach, (2) feel queasy

The swirling motion of the boat made me **queasy**, and I had to sit down to avoid getting sick.

seep

v. to flow or leak slowly and gradually through small openings or spaces; to ooze or trickle out gradually

synonym: leak, ooze, trickle

(1) **seep** cool and moist air, (2) **seep** into paper

The rain began to **seep** through the roof, causing damage to the walls and floors.

opportune

adj. suitable or happening at a time that is suitable or convenient for a particular purpose

synonym: suitable, timely, practical

(1) **opportune** occasion, (2) an **opportune** remark The phone rang at the most **opportune** time.

orchestrate

v. to plan, coordinate, or arrange something, especially skillfully or cleverly; (noun) the act of organizing or directing the elements of a composition, especially in music

synonym: plan, coordinate, arrange

(1) **orchestrate** a takeover, (2) **orchestrate** the political reinstatement

He carefully orchestrated the details of his business plan.

debrief

 to question, investigate, or discuss with someone after an event or task to share information and evaluate the performance

synonym: brief, summarize, rehash

(1) **debrief** their business trip, (2) **debrief** the result After the mission, the team gathered to **debrief** and discuss their success and areas for improvement.

sigma

 n. the eighteenth letter of the Greek alphabet, used in mathematics and science to represent standard deviation or a summation of a series of values

synonym: sum, standard deviation, numerical value

(1) three sigma, (2) sigma notationIn math, the sigma symbol represents a sum of numbers.

Session 2: Spelling

1.	insert caer	n.	a thin, flexible tube that is inserted into a body cavity, duct, or vessel to drain fluid, inject medication, or perform a medical procedure
2.	retire from filng	n.	the process or art of making movies
3.	dette at a slow pace	<i>v</i> .	to become worse in quality; to decline or degenerate
4.	def the result	<i>v</i> .	to question, investigate, or discuss with someone after an event or task to share information and evaluate the performance
5.	min imaging	n.	a unit of measurement equal to one-millionth of a meter, used for measuring the size of particles and microorganisms
6.	a rudry plant	adj.	relating to basic facts or principles; fundamental
7.	impion on stage	n.	the act of making something up on the spot or creating or performing something without preparation
8.	music real	n.	a practice session, usually for a performance or presentation, during which people prepare and fine-tune their performance, often with the help of feedback from others; the act of

ANSWERS: 1. catheter, 2. filmmaking, 3. deteriorate, 4. debrief, 5. micron, 6. rudimentary, 7. improvisation, 8. rehearsal

rehearsing

that is administered to a animal to produce a loss or consciousness so that rgical procedures can be thout causing pain
er or combined into one; tegrated in a way that v entity
nade in something with a specially during a medical
y of an aircraft, including assenger compartments, lds
which cerebrospinal fluid lorless fluid that circulates if the brain and spinal cord) in the ventricles of the g pressure and of the head; a congenital one that can develop as a y or illness
ething full of interest and
or Canadian coin worth a dollar
ations conducted on the em, including the brain, and individual nerves
ppening at a time that is invenient for a particular

ANSWERS: 9. anesthetic, 10. fused, 11. incision, 12. fuselage, 13. hydrocephalus, 14. animate, 15. dime, 16. neurosurgery, 17. opportune

18.	cinaph camera	n.	an early motion picture projector invented by the French Lumière brothers, often used to refer to early cinema in general
19.	specialize in neuery	n.	medical operations conducted on the nervous system, including the brain, spinal cord, and individual nerves
20.	like animation	adj.	resembling or appearing similar to something alive or real, often realistically or vividly; convincing or authentic in appearance or behavior
21.	quy stomach	adj.	feeling or causing discomfort or unease, especially about one's stomach; nauseated or sick; squeamish or easily made to feel unsettled or anxious
22.	opne occasion	adj.	suitable or happening at a time that is suitable or convenient for a particular purpose
23.	inon tool	n.	a sharp cut made in something with a sharp tool, especially during a medical procedure
24.	insect abn	n.	the part of the body between the chest and pelvis that contains the stomach, intestines, liver, pancreas, and other organs; the posterior part of an insect's body, typically divided into segments
25.	cernal fluid	adj.	relating to the brain and spinal cord
26.	indus student	adj.	hardworking, diligent, and persistent in effort

ANSWERS: 18. cinematograph, 19. neurosurgery, 20. lifelike, 21. queasy, 22. opportune, 23. incision, 24. abdomen, 25. cerebrospinal, 26. industrious

27. pi	_e	leal	<
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28. ev___te civilians

29. tw___e hairs

30. d__e store

31. re se an opera

32. in____ne wall

33. fu__d bones

34. feel qu___y

- a tiny hole in a material, often made by a needle, that allows light or other substances to pass through
- v. to remove people or things from a place of danger or threat; to leave or abandon a place or situation, often due to fear or risk
- to pluck or remove hairs, particularly from the face or other sensitive areas, using a pair of tweezers (= a small hand-held tool used for grasping and manipulating small objects with precision) or other specialized tools
- an American or Canadian coin worth one-tenth of a dollar
- v. to practice or repeat something, such as a performance, speech, or action, to prepare for an event or to improve one's skills; to go through the motions of a planned activity before executing it
- a long, tube-like organ in the digestive system that is responsible for absorbing nutrients from food and eliminating waste products
- adj. joined together or combined into one; blended or integrated in a way that creates a new entity
- adj. feeling or causing discomfort or unease,
 especially about one's stomach;
 nauseated or sick; squeamish or easily
 made to feel unsettled or anxious

ANSWERS: 27. pinhole, 28. evacuate, 29. tweeze, 30. dime, 31. rehearse, 32. intestine, 33. fused, 34. queasy

ANSWERS: 35. sneak, 36. orchestrate, 37. limber, 38. fuselage, 39. industrious, 40. congenital, 41. limber, 42. evacuate

risk

a place or situation, often due to fear or

43.	filng industry	n.	the process or art of making movies
44.	congenital hydlus	n.	a condition in which cerebrospinal fluid (= a clear, colorless fluid that circulates in and around the brain and spinal cord) accumulates in the ventricles of the brain, causing pressure and enlargement of the head; a congenital condition or one that can develop as a result of injury or illness
45.	rete a single country	<i>v</i> .	to make something that existed previously happen or appear to exist again
46.	rudry understanding	adj.	relating to basic facts or principles; fundamental
47.	cernal pathway	adj.	relating to the brain and spinal cord
48.	s_p into paper	ν.	to flow or leak slowly and gradually through small openings or spaces; to ooze or trickle out gradually
49.	orcte a takeover	v.	to plan, coordinate, or arrange something, especially skillfully or cleverly; (noun) the act of organizing or directing the elements of a composition, especially in music
50.	hea surgery	n.	a medical condition characterized by the protrusion of an organ or tissue through an opening or weak spot in the abdominal wall or muscles; a bulge or swelling caused by the herniation of organs or tissues

ANSWERS: 43. filmmaking, 44. hydrocephalus, 45. recreate, 46. rudimentary, 47. cerebrospinal, 48. seep, 49. orchestrate, 50. hernia

51.	conal disorder	adj.	existing from birth; often used to describe a condition or trait that is inherited or present from the moment of birth
52.	umbilical hea	n.	a medical condition characterized by the protrusion of an organ or tissue through an opening or weak spot in the abdominal wall or muscles; a bulge or swelling caused by the herniation of organs or tissues
53.	pheal success	adj.	extremely good or impressive; outstanding
54.	the bar's box	ν.	to hit something or someone repeatedly with much force; (noun, baseball) a ballplayer who is batting
55.	twe unwanted hair	ν.	to pluck or remove hairs, particularly from the face or other sensitive areas, using a pair of tweezers (= a small hand-held tool used for grasping and manipulating small objects with precision) or other specialized tools
56.	a young appce	n.	a person who works for and learns from a skilled employer to become a skilled worker themselves
57.	jazz impion	n.	the act of making something up on the spot or creating or performing something without preparation
58.	aneic injection	n.	a substance that is administered to a person or an animal to produce a loss of sensation or consciousness so that medical or surgical procedures can be

ANSWERS: 51. congenital, 52. hernia, 53. phenomenal, 54. batter, 55. tweeze, 56. apprentice, 57. improvisation, 58. anesthetic

performed without causing pain

ANSWERS: 59. neurology, 60. deteriorate, 61. whisk, 62. diaphragm, 63. micron, 64. catheter, 65. sigma, 66. recreate

67. app	ce carpenter	n.	a person who works for and learns from a skilled employer to become a skilled worker themselves
68. large in_	ne	n.	a long, tube-like organ in the digestive system that is responsible for absorbing nutrients from food and eliminating waste products
69. snk a	cigarette	<i>v</i> .	to go somewhere, or take someone or something somewhere secretly or stealthily; to steal or do something secretly or stealthily
70. like	e painting	adj.	resembling or appearing similar to something alive or real, often realistically or vividly; convincing or authentic in appearance or behavior
71. tra	nt glass	adj.	allowing light to pass through but scattering it so that objects behind cannot be seen clearly; partially transparent
72. abr	n pain	n.	the part of the body between the chest and pelvis that contains the stomach, intestines, liver, pancreas, and other organs; the posterior part of an insect's body, typically divided into segments
73. traditiona	al meal	adj.	of or relating to the treatment or cure of disease
74. di	gm activity	n.	a large, dome-shaped muscle located at the bottom of the chest cavity, essential for breathing and separating the chest and abdomen; a shallow, dome-shaped device with a flexible rim that is inserted into the vagina to cover the cervix and prevent sperm from reaching the uterus, serving as a method of birth control

ANSWERS: 67. apprentice, 68. intestine, 69. sneak, 70. lifelike, 71. translucent, 72. abdomen, 73. medicinal, 74. diaphragm

ANSWERS: 75. seep, 76. cinematograph, 77. whisk, 78. rehearsal, 79. neurology, 80. animate, 81. phenomenal, 82. translucent, 83. sigma

or a summation of a series of values

- 84. me____al chemistry
- 85. ba___r the eggs
- 86. de f their business trip
- 87. pi____e image
- 88. re___se a speech

- adj. of or relating to the treatment or cure of disease
- v. to hit something or someone repeatedly with much force; (noun, baseball) a ballplayer who is batting
- v. to question, investigate, or discuss with someone after an event or task to share information and evaluate the performance
- a tiny hole in a material, often made by a needle, that allows light or other substances to pass through
- v. to practice or repeat something, such as a performance, speech, or action, to prepare for an event or to improve one's skills; to go through the motions of a planned activity before executing it

ANSWERS: 84. medicinal, 85. batter, 86. debrief, 87. pinhole, 88. rehearse

Session 3: Fill in the Blanks

1.	You need to up before starting to exercise to prevent injury.
ν.	to make or become more flexible, particularly with exercise or stretching; to prepare oneself mentally or physically for a task or activity
2.	The wires in the electrical circuit caused a power outage.
adj	joined together or combined into one; blended or integrated in a way that creates a new entity
3.	heart defects can often be diagnosed before a baby is born.
adj	existing from birth; often used to describe a condition or trait that is inherited or present from the moment of birth
4.	He has only a knowledge of this topic.
adj	relating to basic facts or principles; fundamental
5.	He got so angry that he the door down.
v.	to hit something or someone repeatedly with much force; (noun, baseball) a ballplayer who is batting
	The nerves carry messages between the brain and the rest of the body.
adj	relating to the brain and spinal cord
7.	After the surgery, the patient was required to wear a for several days.
n.	a thin, flexible tube that is inserted into a body cavity, duct, or vessel to drain fluid, inject medication, or perform a medical procedure
	SWERS: 1. limber, 2. fused, 3. Congenital, 4. rudimentary, 5. battered, 6.

ANSWERS: 15. microns, 16. fuselage, 17. rehearsal, 18. recreated, 19. hydrocephalus, 20. sneak, 21. opportune

43.	The camera'sle	ns creates a unique blur effect in photographs.
n.	a tiny hole in a material substances to pass thro	often made by a needle, that allows light or other ough
44. n.	He took on an a person who works for worker themselves	to teach him the trade. and learns from a skilled employer to become a skilled

ANSWERS: 43. pinhole, 44. apprentice