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Taneka Jones: How to 3D print human tissue | TED Talk

https://www.ted.com/talks/taneka_jones_how_to_3d_print_human_tissue

Advanced Words Only

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Session 1: Word List

regenerative

adj. tending to regrow or restore lost or injured tissue
synonym: rejuvenating, restorative, healing

(1) **regenerative** medicine, (2) **regenerative** therapy

The **regenerative** properties of stem cells make them a promising area of research.

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.

hydrogel

n. a gel-like substance made of polymer chains that can absorb and retain large amounts of water; commonly used in medical and cosmetic applications, such as wound dressings and contact lenses

(1) hemostatic **hydrogel**, (2) soft contact **hydrogel**

The medical **hydrogel** was infused with medications to help heal the wound faster.

meniscus

n. a thin, curved layer of liquid, especially the concave surface of a liquid in a container; a cartilage disc within a joint, especially a knee

synonym : cartilage, crescent, curve

(1) medial **meniscus**, (2) **meniscus** surgery

Basketball players risk damaging their **meniscus** more due to the constant jumping and quick movements.

cartilage

n. a tough, elastic connective tissue that is found in various parts of the body, such as the joints, the outer ear, and the tip of the nose

synonym : connective tissue, gristle, fibrocartilage

(1) **cartilage** damage, (2) nasal **cartilage**

The knee joint is supported by **cartilage**, which helps absorb shock and prevent bone damage.

shinbone

n. the long bone in the front of the leg, also referred to as the tibia

synonym : tibia, shank bone

(1) fractured **shinbone**, (2) sore **shinbone**

She fell and bruised her **shinbone** on the edge of the table.

thighbone

n. the long bone in the upper leg, also referred to as the femur

synonym : femur, upper leg bone

(1) dislocated **thighbone**, (2) **thighbone** injury

He broke his **thighbone** in a skiing accident.

grind

v. to reduce something to small particles or powder by crushing or rubbing it; to work hard over a long period of time

synonym : mill, crush, grate

(1) **grind** away at my work, (2) **grind** your teeth

She had to **grind** the coffee beans before making a fresh cup.

chondrocyte

n. a specialized type of cell that produces and maintains the extracellular matrix of cartilage, a connective tissue found in many parts of the body

synonym : cartilage cell

(1) mature **chondrocyte**, (2) **chondrocyte** proliferation
The **chondrocyte** cells in the articular cartilage are responsible for maintaining joint health.

originate

v. to come into existence in a particular place or situation; to start something in a specific place

synonym: begin, arise, create

(1) **originate** from the country, (2) **originate** a political movement

The flight **originates** in Vancouver.

extrude

v. to force, push, or press out through a narrow opening or nozzle, often in a continuous fashion; to shape materials by squeezing them through a die or mold

synonym: squeeze, force, press out

(1) **extrude** rubber, (2) **extrude** metal

The artist used a pasta machine to **extrude** clay into intricate shapes.

nozzle

n. a tube or spout through which a liquid or gas is discharged, particularly one attached to a hose, pump, or spray gun

synonym: spout, sprayer, tube

(1) **nozzle** attachment, (2) fuel **nozzle**

The car wash **nozzle** sprayed a powerful stream of soapy water onto the vehicle.

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**.

filament

n. a thin wire or thread, especially one used to produce light in an electric bulb

synonym: fiber, thread, filament

(1) **filament** lamp, (2) carbon **filament**

The **filament** in the light bulb burned out, and now it's not working.

fingernail

n. the hard, slightly curved part that covers the outer tip of each finger

synonym: claw, paw

(1) **fingernail** biting, (2) fake **fingernail**

The car body scraped off with a **fingernail**.

stabilize

v. to become or cause to become steady or unlikely to give way

synonym: brace, steady, secure

(1) **stabilize** prices, (2) **stabilize** blood sugar levels

The raising of interest rates **stabilizes** the inflation rate.

stiffen

v. to make or become stiff or rigid; to become inflexible or unyielding in one's attitude or behavior

synonym: harden, solidify, tense

(1) **stiffen** joints, (2) **stiffen** penalties

The cold weather made my muscles **stiffen** up.

regeneration

n. the process of regrowing or re-forming a body part or tissue that has been lost or damaged due to injury, disease, or other factors; restoration or renewal of vitality, strength, or spirit

synonym: renewal, regrowth, restoration

(1) economic **regeneration**, (2) **regeneration** of forests

The **regeneration** of the damaged tissue in the body is a slow process.

biochemical

adj. relating to the chemical processes and substances that occur within living organisms

synonym: molecular, biological

(1) **biochemical** reaction, (2) complex **biochemical**

Biochemical research is essential to understanding the

complex chemical reactions in living organisms.

formidable

adj. causing fear, apprehension, or awe; difficult to deal with or overcome; capable of inspiring respect or admiration

synonym: daunting, intimidating, fearful

(1) **formidable** challenge, (2) **formidable** competitor

The mountain range was a **formidable** obstacle for the hikers.

dizzy

adj. having or causing a whirling sensation and not able to keep balance

synonym: addled, confounded, unsteady

(1) feel **dizzy**, (2) had a **dizzy** spell

Professional skaters can spin fast on the ice without getting **dizzy**.

Session 2: Spelling

1. soft contact hy_____el
n. a gel-like substance made of polymer chains that can absorb and retain large amounts of water; commonly used in medical and cosmetic applications, such as wound dressings and contact lenses
2. fi_____nt lamp
n. a thin wire or thread, especially one used to produce light in an electric bulb
3. hemostatic hy_____el
n. a gel-like substance made of polymer chains that can absorb and retain large amounts of water; commonly used in medical and cosmetic applications, such as wound dressings and contact lenses
4. st_____n joints
v. to make or become stiff or rigid; to become inflexible or unyielding in one's attitude or behavior
5. mature cho_____te
n. a specialized type of cell that produces and maintains the extracellular matrix of cartilage, a connective tissue found in many parts of the body
6. carbon fi_____nt
n. a thin wire or thread, especially one used to produce light in an electric bulb
7. bio_____al reaction
adj. relating to the chemical processes and substances that occur within living organisms
8. no___e attachment
n. a tube or spout through which a liquid or gas is discharged, particularly one attached to a hose, pump, or spray gun

ANSWERS: 1. hydrogel, 2. filament, 3. hydrogel, 4. stiffen, 5. chondrocyte, 6. filament, 7. biochemical, 8. nozzle

9. me____us surgery *n.* a thin, curved layer of liquid, especially the concave surface of a liquid in a container; a cartilage disc within a joint, especially a knee
10. mi____n imaging *n.* a unit of measurement equal to one-millionth of a meter, used for measuring the size of particles and microorganisms
11. medial me____us *n.* a thin, curved layer of liquid, especially the concave surface of a liquid in a container; a cartilage disc within a joint, especially a knee
12. fractured sh____ne *n.* the long bone in the front of the leg, also referred to as the tibia
13. or____te from the country *v.* to come into existence in a particular place or situation; to start something in a specific place
14. gr__d away at my work *v.* to reduce something to small particles or powder by crushing or rubbing it; to work hard over a long period of time
15. ex____e rubber *v.* to force, push, or press out through a narrow opening or nozzle, often in a continuous fashion; to shape materials by squeezing them through a die or mold
16. st____n penalties *v.* to make or become stiff or rigid; to become inflexible or unyielding in one's attitude or behavior
17. nasal ca____ge *n.* a tough, elastic connective tissue that is found in various parts of the body, such as the joints, the outer ear, and the tip of the nose

ANSWERS: 9. meniscus, 10. micron, 11. meniscus, 12. shinbone, 13. originate, 14. grind, 15. extrude, 16. stiffen, 17. cartilage

18. gr__d your teeth *v.* to reduce something to small particles or powder by crushing or rubbing it; to work hard over a long period of time
19. mi___n measurements *n.* a unit of measurement equal to one-millionth of a meter, used for measuring the size of particles and microorganisms
20. st_____ze prices *v.* to become or cause to become steady or unlikely to give way
21. for_____le challenge *adj.* causing fear, apprehension, or awe; difficult to deal with or overcome; capable of inspiring respect or admiration
22. fin_____il biting *n.* the hard, slightly curved part that covers the outer tip of each finger
23. for_____le competitor *adj.* causing fear, apprehension, or awe; difficult to deal with or overcome; capable of inspiring respect or admiration
24. reg_____ive medicine *adj.* tending to regrow or restore lost or injured tissue
25. or_____te a political movement *v.* to come into existence in a particular place or situation; to start something in a specific place
26. me_____al chemistry *adj.* of or relating to the treatment or cure of disease
27. dislocated th_____ne *n.* the long bone in the upper leg, also referred to as the femur
28. st_____ze blood sugar levels *v.* to become or cause to become steady or unlikely to give way

ANSWERS: 18. grind, 19. micron, 20. stabilize, 21. formidable, 22. fingernail, 23. formidable, 24. regenerative, 25. originate, 26. medicinal, 27. thighbone, 28. stabilize

29. sore sh____ne *n.* the long bone in the front of the leg, also referred to as the tibia
30. reg____ive therapy *adj.* tending to regrow or restore lost or injured tissue
31. reg____ion of forests *n.* the process of regrowing or re-forming a body part or tissue that has been lost or damaged due to injury, disease, or other factors; restoration or renewal of vitality, strength, or spirit
32. fuel no____e *n.* a tube or spout through which a liquid or gas is discharged, particularly one attached to a hose, pump, or spray gun
33. traditional me____al *adj.* of or relating to the treatment or cure of disease
34. economic reg____ion *n.* the process of regrowing or re-forming a body part or tissue that has been lost or damaged due to injury, disease, or other factors; restoration or renewal of vitality, strength, or spirit
35. ex____e metal *v.* to force, push, or press out through a narrow opening or nozzle, often in a continuous fashion; to shape materials by squeezing them through a die or mold
36. feel di__y *adj.* having or causing a whirling sensation and not able to keep balance
37. ca____ge damage *n.* a tough, elastic connective tissue that is found in various parts of the body, such as the joints, the outer ear, and the tip of the nose

ANSWERS: 29. shinbone, 30. regenerative, 31. regeneration, 32. nozzle, 33. medicinal, 34. regeneration, 35. extrude, 36. dizzy, 37. cartilage

38. had a di__y spell *adj.* having or causing a whirling sensation and not able to keep balance
39. th_____ne injury *n.* the long bone in the upper leg, also referred to as the femur
40. complex bio_____al *adj.* relating to the chemical processes and substances that occur within living organisms
41. fake fin_____il *n.* the hard, slightly curved part that covers the outer tip of each finger
42. cho_____te proliferation *n.* a specialized type of cell that produces and maintains the extracellular matrix of cartilage, a connective tissue found in many parts of the body

ANSWERS: 38. dizzy, 39. thighbone, 40. biochemical, 41. fingernail, 42. chondrocyte

Session 3: Fill in the Blanks

1. The _____ of the damaged tissue in the body is a slow process.
n. the process of regrowing or re-forming a body part or tissue that has been lost or damaged due to injury, disease, or other factors; restoration or renewal of vitality, strength, or spirit
2. She fell and bruised her _____ on the edge of the table.
n. the long bone in the front of the leg, also referred to as the tibia
3. The mountain range was a _____ obstacle for the hikers.
adj. causing fear, apprehension, or awe; difficult to deal with or overcome; capable of inspiring respect or admiration
4. The car wash _____ sprayed a powerful stream of soapy water onto the vehicle.
n. a tube or spout through which a liquid or gas is discharged, particularly one attached to a hose, pump, or spray gun
5. The _____ cells in the articular cartilage are responsible for maintaining joint health.
n. a specialized type of cell that produces and maintains the extracellular matrix of cartilage, a connective tissue found in many parts of the body
6. The artist used a pasta machine to _____ clay into intricate shapes.
v. to force, push, or press out through a narrow opening or nozzle, often in a continuous fashion; to shape materials by squeezing them through a die or mold
7. The _____ properties of stem cells make them a promising area of research.
adj. tending to regrow or restore lost or injured tissue

ANSWERS: 1. regeneration, 2. shinbone, 3. formidable, 4. nozzle, 5. chondrocyte, 6. extrude, 7. regenerative

8. 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
9. The knee joint is supported by _____ which helps absorb shock and prevent bone damage.
- n.* a tough, elastic connective tissue that is found in various parts of the body, such as the joints, the outer ear, and the tip of the nose
10. The flight _____ in Vancouver.
- v.* to come into existence in a particular place or situation; to start something in a specific place
11. The _____ in the light bulb burned out, and now it's not working.
- n.* a thin wire or thread, especially one used to produce light in an electric bulb
12. Basketball players risk damaging their _____ more due to the constant jumping and quick movements.
- n.* a thin, curved layer of liquid, especially the concave surface of a liquid in a container; a cartilage disc within a joint, especially a knee
13. Professional skaters can spin fast on the ice without getting _____.
- adj.* having or causing a whirling sensation and not able to keep balance
14. She had to _____ the coffee beans before making a fresh cup.
- v.* to reduce something to small particles or powder by crushing or rubbing it; to work hard over a long period of time
15. _____ research is essential to understanding the complex chemical reactions in living organisms.
- adj.* relating to the chemical processes and substances that occur within living organisms

ANSWERS: 8. microns, 9. cartilage, 10. originates, 11. filament, 12. meniscus, 13. dizzy, 14. grind, 15. Biochemical

16. The _____ properties of this herb have been known to help with various ailments.

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

17. The medical _____ was infused with medications to help heal the wound faster.

n. a gel-like substance made of polymer chains that can absorb and retain large amounts of water; commonly used in medical and cosmetic applications, such as wound dressings and contact lenses

18. The raising of interest rates _____ the inflation rate.

v. to become or cause to become steady or unlikely to give way

19. The cold weather made my muscles _____ up.

v. to make or become stiff or rigid; to become inflexible or unyielding in one's attitude or behavior

20. He broke his _____ in a skiing accident.

n. the long bone in the upper leg, also referred to as the femur

21. The car body scraped off with a _____.

n. the hard, slightly curved part that covers the outer tip of each finger

ANSWERS: 16. medicinal, 17. hydrogel, 18. stabilizes, 19. stiffen, 20. thighbone, 21. fingernail