The AhaBulb Party Game

STUFF EVERY ENGINEER SHOULD KNOW

How to play (30 seconds)

1. The reader reads a card and its three answers out loud.
2. Everyone says "One, two, three, Goldilocks!" and holds up 1, 2, or 3 fingers.
3. The reader flips the card and reads the answer and the Why.
4. Everyone who was right takes a point.
5. The reader reads the joke with a straight face. Anyone laughs or groans? The reader takes a point. Nobody got it right? The reader takes a point.
6. Pass the deck left. Most points when the points run out wins.

What you need

These cards and the point tokens on the last two pages. No tokens? Use coins, buttons, pebbles, or marshmallows. 3 to 10 players, ages 8 and up.

Expert rule: Bet It

Before the reader flips the card, you may put one of your points on your answer. Right: take your normal point plus one extra. Wrong: your bet goes back to the pile. That's it.

Printing

Print single-sided, on cardstock if you have it. Cut on the dashed lines. Each card is a 3.5 x 5 inch index card. The answer half is upside down on purpose, so the table can't peek.

Cards 1 to 50 of 165. More cards and the free daily online game at sesk.info. Built 2026-10-14.

ENGINEERING

How many base units does the International System of Units (SI) have?

- **A** 7
- **B** 22
- **C** 3

FLIP FOR THE ANSWER

A 7

WHY The SI rests on 7 base units. Every other unit, like the newton or the volt, is built by multiplying and dividing those seven.

STRAIGHT FACE
Why did the meter, kilogram and second start a band? They were the base section.

SESK.INFO #3061

ENGINEERING

Since the SI redefinition voted in 2018, what defines the kilogram?

- **A** A platinum-iridium cylinder kept near Paris
- **B** The Planck constant, a constant of nature
- **C** The mass of one liter of pure water

FLIP FOR THE ANSWER

B The Planck constant, a constant of nature

WHY For over a century the kilogram was one metal cylinder, Le Grand K. Now it is tied to the Planck constant, so any well-equipped lab can realize it without visiting the cylinder.

STRAIGHT FACE
The old kilogram retired in 2019. It had been carrying a lot of weight for 130 years.

SESK.INFO #3062

ENGINEERING

In today's SI, how precisely is the value of the Planck constant known?

- **A** To about 8 digits, refined each year
- **B** Only as an average of world labs
- **C** Exactly, because the SI fixes its value

FLIP FOR THE ANSWER

C Exactly, because the SI fixes its value

WHY The revised SI turns the logic around. Seven constants of nature get exact fixed values, and the units are defined from them. So h has no measurement uncertainty any more.

STRAIGHT FACE
The Planck constant never changes its mind. It is very set in its ways.

SESK.INFO #3063

ENGINEERING

One newton of force equals which combination of SI base units?

- **A** 1 kg times m/s squared
- **B** 1 kg times m/s
- **C** 1 kg times 9.81 m

FLIP FOR THE ANSWER

A 1 kg times m/s squared

WHY Newton's second law says force equals mass times acceleration. One newton is the force that speeds up 1 kilogram by 1 meter per second, every second.

STRAIGHT FACE
Why did the newton bring a ruler? It wanted to measure its force of habit.

SESK.INFO #3064

ENGINEERING

A watt measures power. What is one watt equal to?

- **A** One joule per hour
- **B** One newton per meter
- **C** One joule per second

FLIP FOR THE ANSWER

C One joule per second

WHY Power is the rate of doing work. A 100 W bulb uses 100 joules every second. The watt hour is an amount of energy, not a power.

STRAIGHT FACE
Watt did the light bulb say to the switch? You turn me on.

SESK.INFO #3066

ENGINEERING

One joule of work is the same as what?

- **A** One watt for one hour
- **B** One newton moved through one meter
- **C** One newton per square meter

FLIP FOR THE ANSWER

B One newton moved through one meter

WHY Work is force times distance. Push with 1 newton over 1 meter and you have done 1 joule of work, the SI unit for both work and energy.

STRAIGHT FACE
I tried to lift a joule of energy, but it was just a little bit of work.

SESK.INFO #3065

ENGINEERING

In SI symbols, how is MW different from mW?

- **A** They mean the same; case does not matter
- **B** MW is a million watts; mW is a thousandth
- **C** MW is a thousandth of a watt; mW is a million

FLIP FOR THE ANSWER

B MW is a million watts; mW is a thousandth

WHY Case matters in SI prefixes. Capital M is mega, 10 to the 6th. Lowercase m is milli, 10 to the minus 3rd. Mixing them up is an error of a billion times.

STRAIGHT FACE
My power plant is mega. My phone charger is milli. Same letter, very different attitude.

SESK.INFO #3068

ENGINEERING

The pascal, the SI unit of pressure and stress, equals what?

- **A** One newton per square meter
- **B** One newton times one meter
- **C** One kilogram per cubic meter

FLIP FOR THE ANSWER

A One newton per square meter

WHY Pressure is force spread over an area. One pascal is tiny, so engineers usually work in kilopascals, megapascals and gigapascals.

STRAIGHT FACE
Why was the pascal so calm? It never let pressure get to it, only spread it out.

SESK.INFO #3067

ENGINEERING

What factor does the SI prefix micro (symbol μ) stand for?

- **A** One thousandth (10^-3)
- **B** One billionth (10^-9)
- **C** One millionth (10^-6)

FLIP FOR THE ANSWER

C One millionth (10^-6)

WHY The small prefixes step by a factor of a thousand: milli is 10^-3, micro is 10^-6, nano is 10^-9. Micro uses the Greek letter mu.

STRAIGHT FACE
I bought a microwave, but it only waves one millionth as much.

SESK.INFO #3069

ENGINEERING

How many significant figures are in the measurement 0.00450 m?

- **A** Six
- **B** Three
- **C** Two

FLIP FOR THE ANSWER

B Three

WHY Leading zeros are never significant. A trailing zero after the decimal point is significant, because someone measured it. So 0.00450 has 3 significant figures.

STRAIGHT FACE
Leading zeros arrived early, but they still did not count.

SESK.INFO #3070

ENGINEERING

A scale gives 5.21, 5.22 and 5.21 kg for a true 6.00 kg mass. The readings are:

- **A** Precise but not accurate
- **B** Accurate but not precise
- **C** Both accurate and precise

FLIP FOR THE ANSWER

A Precise but not accurate

WHY Accuracy is closeness to the true value. Precision is how closely repeated readings agree. Tight readings that are all off by the same amount usually mean a calibration error.

STRAIGHT FACE
My dart throws are very precise. They all hit the same spot on the wall.

SESK.INFO #3071

ENGINEERING

In measurement standards, what is a tolerance?

- **A** The average of many repeat readings
- **B** The smallest digit an instrument can show
- **C** The limits of allowable error from the true value

FLIP FOR THE ANSWER

C The limits of allowable error from the true value

WHY No real device is perfect, so standards set how far off it may be and still pass. A part drawn as 25.00 mm plus or minus 0.05 mm passes anywhere from 24.95 to 25.05 mm.

STRAIGHT FACE
My tolerance for bad unit jokes is plus or minus zero.

SESK.INFO #3072

ENGINEERING

About how many newtons are in one pound-force?

A About 4.45 N

B About 0.45 N

C About 9.81 N

FLIP FOR THE ANSWER

A About 4.45 N

WHY One pound-force is about 4.45 newtons. That is why the Mars Climate Orbiter's thruster effects were underestimated by a factor of about 4.45.

STRAIGHT FACE
I asked for a pound of force and got 4.45 newtons.
The exchange rate is brutal.

SESK.INFO #3074

ENGINEERING

Mars Climate Orbiter was lost in 1999 because software mixed up which units?

A Miles and kilometers

B Pound-seconds and newton-seconds

C Degrees Fahrenheit and Celsius

FLIP FOR THE ANSWER

B Pound-seconds and newton-seconds

WHY Thruster impulse data in a ground file called Small Forces was in pound-seconds, but the navigation software expected newton-seconds. The trajectory errors sent the craft too close to Mars.

STRAIGHT FACE
Why did the engineer label every result? So the units would never feel left out.

SESK.INFO #3073

ENGINEERING

In the US British Gravitational system used in statics, what is the unit of mass?

A The pound

B The ounce

C The slug

FLIP FOR THE ANSWER

C The slug

WHY In engineering statics, pounds always mean pounds-force. To get mass, divide weight by g: a 100 lb object has a mass of about 3.1 slugs (100 / 32.2).

STRAIGHT FACE
My engineering professor measures mass in slugs.
Class moves very slowly.

SESK.INFO #3076

ENGINEERING

A 5.0 kg wrench is taken to the Moon. What happens to it?

A Its mass and weight both drop

B Its mass stays the same, its weight drops

C Its weight stays the same, its mass drops

FLIP FOR THE ANSWER

B Its mass stays the same, its weight drops

WHY Mass is the amount of matter and does not change with location. Weight is the gravitational force on that mass, measured in newtons, so it shrinks where gravity is weaker.

STRAIGHT FACE
I'm not overweight, I'm just on the wrong planet.

SESK.INFO #3075

ENGINEERING

For an object at rest, Newton's second law F = ma becomes what?

- **A** The sum of forces equals zero
- **B** Force equals mass
- **C** Force equals mass times g

FLIP FOR THE ANSWER

A The sum of forces equals zero

WHY Statics studies things that do not accelerate. With a = 0, the net force must be zero, and the net moment must be zero too.

STRAIGHT FACE
Statics is the only class where doing nothing is the right answer.

SESK.INFO #3077

ENGINEERING

What does a free-body diagram show?

- **A** All forces in the whole system at once
- **B** The forces the body pushes onto its supports
- **C** One isolated body and the forces acting on it

FLIP FOR THE ANSWER

C One isolated body and the forces acting on it

WHY You cut the body free, replace each support or contact with the force it applies, and draw those. Forces the body exerts on other things belong on those other bodies' diagrams.

STRAIGHT FACE
I drew a free-body diagram of myself on Monday. Every arrow pointed back to bed.

SESK.INFO #3078

ENGINEERING

A force's line of action passes right through the pivot. What moment does it make about that pivot?

- **A** Its full force times the bar length
- **B** Half its force times the bar length
- **C** Zero

FLIP FOR THE ANSWER

C Zero

WHY Moment equals force times the perpendicular distance from the pivot to the force's line of action. If the line goes through the pivot, that distance is zero.

STRAIGHT FACE
I pushed on the door right at the hinge for an hour. Zero moments of progress.

SESK.INFO #3079

ENGINEERING

Torque is force times lever arm. Which SI unit is correct for torque?

- **A** Newton meters (N·m)
- **B** Newtons per meter (N/m)
- **C** Newtons per square meter (Pa)

FLIP FOR THE ANSWER

A Newton meters (N·m)

WHY Torque multiplies a force by a distance, so its unit is the newton times the meter. Newtons per meter is a spring stiffness, a very different thing.

STRAIGHT FACE
I tried to loosen a stuck bolt with a short wrench. I just didn't have the torque of experience.

SESK.INFO #3080

ENGINEERING

When solving a static equilibrium problem, where are you allowed to sum moments?

- **A** Only at the center of mass
- **B** Only at an actual hinge or support
- **C** About any point you choose

FLIP FOR THE ANSWER

C About any point you choose

WHY If a body is in equilibrium, the net moment is zero about every point. Engineers pick a point where unknown forces act, so those unknowns drop out of the equation.

STRAIGHT FACE
I'm very flexible in statics. I'll pivot anywhere you like.

SESK.INFO #3081

ENGINEERING

For most material pairs, how does the static friction coefficient compare to the kinetic one?

- **A** Static is usually larger
- **B** Kinetic is usually larger
- **C** They are always equal

FLIP FOR THE ANSWER

A Static is usually larger

WHY That is why a heavy box is hardest to push right before it budges, then gets easier. For dry steel on steel, static is about 0.6 and kinetic about 0.3.

STRAIGHT FACE
Static friction is like me on a Monday morning. Hard to get started, easier once I'm moving.

SESK.INFO #3082

ENGINEERING

In the basic dry friction model, does a wider contact area increase the friction force?

- **A** Yes, friction grows with contact area
- **B** No, it depends on normal force and materials
- **C** Only for metals

FLIP FOR THE ANSWER

B No, it depends on normal force and materials

WHY The model is friction = coefficient times normal force. Spread the same weight over a bigger area and the pressure drops by the same factor, so the total friction stays about the same.

STRAIGHT FACE
I lay down flat on the floor to get more friction. I just got more nap.

SESK.INFO #3083

ENGINEERING

About what is the static friction coefficient for rubber on dry concrete?

- **A** About 0.04
- **B** About 0.1
- **C** About 1.0

FLIP FOR THE ANSWER

C About 1.0

WHY With a coefficient near 1.0, the friction force can be about as large as the normal force. Ice on ice is near 0.1, and Teflon on steel is about 0.04.

STRAIGHT FACE
Rubber and concrete are very close friends. They really stick together.

SESK.INFO #3084

ENGINEERING

In mechanics of materials, what is stress?

- **A** The total force on a part
- **B** Force per unit area
- **C** The change in length per unit length

FLIP FOR THE ANSWER

B Force per unit area

WHY Stress lets you compare a thin wire and a thick bar fairly. The same force in a smaller cross section gives higher stress, which is what makes parts fail.

STRAIGHT FACE
My bridge is under a lot of stress, but at least it's spread over a big area.

SESK.INFO #3085

ENGINEERING

A 2 m bar stretches 1 mm. What are the units of its strain?

- **A** Millimeters
- **B** Pascals
- **C** None; it is dimensionless

FLIP FOR THE ANSWER

C None; it is dimensionless

WHY Strain is the change in length divided by the original length: 0.001 m / 2 m = 0.0005. Meters cancel, leaving a pure number.

STRAIGHT FACE
I asked the strain gauge how it felt. It said, no units of complaint.

SESK.INFO #3086

ENGINEERING

Steel's Young's modulus is about 200 GPa. Aluminum's is about how much?

- **A** About 200 GPa, the same as steel
- **B** About 70 GPa
- **C** About 2 GPa

FLIP FOR THE ANSWER

B About 70 GPa

WHY Young's modulus measures stiffness: stress per unit strain. Under the same stress, an aluminum part stretches about three times as much as a steel part of the same shape.

STRAIGHT FACE
Aluminum asked steel why it was so stiff. Steel said, it's just how I was raised, about 200 gigapascals.

SESK.INFO #3087

ENGINEERING

In Hooke's law, F = -kx, what are the SI units of the spring constant k?

- **A** Newtons per meter
- **B** Newton meters
- **C** Newtons per square meter

FLIP FOR THE ANSWER

A Newtons per meter

WHY k tells you how many newtons it takes to stretch or squeeze the spring by one meter. A bigger k means a stiffer spring. The minus sign means the spring pushes back toward its rest length.

STRAIGHT FACE
Why was the spring so good at relationships? It always bounced back.

SESK.INFO #3088

ENGINEERING

What happens when a metal part is loaded past its elastic limit and then unloaded?

- **A** It returns exactly to its original shape
- **B** It stays permanently deformed
- **C** It instantly snaps in two

FLIP FOR THE ANSWER

B **It stays permanently deformed**

WHY Below the elastic limit, a material springs back like a spring. Past it, the deformation is plastic and permanent. Fracture occurs only after further deformation and loading.

STRAIGHT FACE
I pushed my paper clip past its elastic limit. Now it's permanently bent out of shape about it.

SESK.INFO #3089

ENGINEERING

NASA's structural standard sets what minimum ultimate design factor for metallic spaceflight structures?

- **A** 1.4
- **B** 4.0
- **C** 10

FLIP FOR THE ANSWER

A **1.4**

WHY A design factor multiplies the limit load, the largest expected service load. NASA's table gives an ultimate design factor of 1.4 for metallic structures using either prototype or prototflight verification.

STRAIGHT FACE
My factor of safety for leaving for the airport is 1.4. My spouse's is 4.

SESK.INFO #3090

ENGINEERING

A beam rests on two supports with a load in the middle. Which side is in tension?

- **A** The top
- **B** The bottom
- **C** Neither; beams carry only shear

FLIP FOR THE ANSWER

B **The bottom**

WHY As the beam sags, the top fibers get shorter and the bottom fibers get longer. Brittle materials like chalk or glass crack from the bottom, tension side first.

STRAIGHT FACE
The beam was feeling down in the middle, but at least the bottom held it together under tension.

SESK.INFO #3091

ENGINEERING

In a homogeneous beam under simple bending, where is normal bending stress zero?

- **A** At the top surface
- **B** At the neutral axis through the centroid
- **C** At the supports only

FLIP FOR THE ANSWER

B **At the neutral axis through the centroid**

WHY For a homogeneous beam in simple bending, normal stress varies linearly from zero at the neutral axis to its greatest magnitude at the outer surfaces. The neutral axis passes through the cross-section's centroid.

STRAIGHT FACE
The neutral axis never takes sides in an argument between tension and compression.

SESK.INFO #3092

ENGINEERING

Why is an I-beam shaped like an I?

- **A** To make welding the ends easier
- **B** It is cheapest to roll that shape
- **C** It puts most material far from the bending axis

FLIP FOR THE ANSWER

C It puts most material far from the bending axis

WHY Area far from the neutral axis contributes strongly to the area moment of inertia. The flanges carry much of the bending stress, while the web separates them and also carries shear.

STRAIGHT FACE
Why do I-beams make great leaders? They put their best material where it counts.

SESK.INFO #3093

ENGINEERING

A 1/8 inch thick, 1 inch tall ruler is bent on edge instead of flat. How much stiffer is it?

- **A** About the same
- **B** About 2 times
- **C** 64 times

FLIP FOR THE ANSWER

C 64 times

WHY For a rectangle, bending stiffness follows bh cubed. Turning this 1 by 1/8 inch section swaps b and h, changing their ratio by (1 divided by 1/8) squared, or 64.

STRAIGHT FACE
My ruler tried to bend on edge. It just couldn't measure up.

SESK.INFO #3094

ENGINEERING

Why are bridge and roof trusses built from triangles?

- **A** Triangles use the least steel of any shape
- **B** Triangles are easier to paint
- **C** A pinned triangle cannot change shape

FLIP FOR THE ANSWER

C A pinned triangle cannot change shape

WHY A square with pinned corners folds into a diamond. A triangle with pinned corners can only deform if a member stretches or shortens. Planar trusses are built from triangular subunits for this reason.

STRAIGHT FACE
Why do engineers love triangles? Every other shape keeps folding under pressure.

SESK.INFO #3095

ENGINEERING

In an ideal pin-jointed truss, what kind of force does each member carry?

- **A** Only axial tension or compression
- **B** Mostly bending
- **C** Mostly twisting

FLIP FOR THE ANSWER

A Only axial tension or compression

WHY Each member is a two-force member: loads only at its two pinned ends. For it to balance, those forces must line up along the member, so it is simply pulled or pushed.

STRAIGHT FACE
Truss members are simple folks. They're either tense or compressed, never bent out of shape.

SESK.INFO #3096

ENGINEERING

If a slender pinned column is made half as long, its critical buckling load:

- **A** Doubles
- **B** Stays the same
- **C** Goes up four times

FLIP FOR THE ANSWER

C Goes up four times

WHY Long, slender columns in compression fail by suddenly bowing sideways, not by crushing. Euler's formula puts length squared in the denominator, so halving the length quadruples the load it can carry.

STRAIGHT FACE
The tall column buckled under pressure. The short one just shrugged it off.

SESK.INFO #3097

ENGINEERING

How can metal fatigue break a part that never sees a load above its yield strength?

- **A** Damage builds up over many repeated cycles
- **B** Metal slowly evaporates under load
- **C** It cannot; fatigue needs loads above yield

FLIP FOR THE ANSWER

A Damage builds up over many repeated cycles

WHY Repeated loading can start a tiny crack at a flaw or stress concentration. The crack can grow with later cycles until the remaining section can no longer carry the load.

STRAIGHT FACE
I asked the metal why it was tired. It said it had been through too many cycles.

SESK.INFO #3098

ENGINEERING

Which metal typically has a fatigue endurance limit below which fatigue failure is not expected?

- **A** Aluminum
- **B** Steel
- **C** Both equally

FLIP FOR THE ANSWER

B Steel

WHY For many ferrous alloys, the S-N curve flattens to an endurance limit. Aluminum's curve keeps falling, so designers use a specified fatigue life rather than assuming unlimited cycles.

STRAIGHT FACE
Steel has an endurance limit. My kids do not.

SESK.INFO #3099

ENGINEERING

How is the mechanical advantage (MA) of a simple machine defined?

- **A** Output work divided by input work
- **B** Input distance times input force
- **C** Output force divided by input force

FLIP FOR THE ANSWER

C Output force divided by input force

WHY An MA of 5 means an input force of 1 unit produces 5 units of output force. In an ideal machine, the input point moves 5 times farther. Output work divided by input work is efficiency, not MA.

STRAIGHT FACE
Give me a lever long enough and I'll move the world. Just don't ask me to carry it home.

SESK.INFO #3100

ENGINEERING

For an ideal pulley system, the mechanical advantage is roughly equal to what?

- **A** The number of cable segments supporting the load
- **B** The diameter of the largest pulley
- **C** Always 2, no matter the setup

FLIP FOR THE ANSWER

A The number of cable segments supporting the load

WHY If four cable segments hold up the load block, each carries a quarter of the weight, so you pull with about a quarter of the force. You also pull four times as much rope.

STRAIGHT FACE
I tried to lift a piano with one pulley. It was a strain, with no advantage.

SESK.INFO #3101

ENGINEERING

A 12-tooth motor gear drives a 36-tooth wheel gear. Ideally, what happens to the output torque?

- **A** It triples, and speed drops to a third
- **B** It drops to a third, and speed triples
- **C** Torque and speed both triple

FLIP FOR THE ANSWER

A It triples, and speed drops to a third

WHY Gear ratio is output teeth over input teeth: 36 / 12 = 3. Torque is multiplied by the ratio and rotational speed divided by it. Gearing down trades speed for torque.

STRAIGHT FACE
I'm not slow, I'm geared for torque.

SESK.INFO #3102

ENGINEERING

Which typically converts input energy into useful work most efficiently?

- **A** A gasoline car engine
- **B** A large electric motor
- **C** They are about equal

FLIP FOR THE ANSWER

B A large electric motor

WHY Efficiency is useful work out divided by energy in. Most of a gasoline engine's fuel energy leaves as heat, while big electric motors waste very little.

STRAIGHT FACE
I'm 98% efficient, like an electric motor. The other 2% is coffee breaks.

SESK.INFO #3103

ENGINEERING

Which common structural metal is stiffest for the same cross-sectional shape?

- **A** Steel
- **B** Titanium
- **C** Aluminum

FLIP FOR THE ANSWER

A Steel

WHY Elastic modulus measures resistance to elastic stretching. Typical values are about 30 Msi for steel, 16 Msi for titanium, and 10 Msi for aluminum.

STRAIGHT FACE
Why did steel ace the posture test? It refused to bend the rules.

SESK.INFO #3104

ENGINEERING

Which is least dense: aluminum, titanium, or iron?

- **A** Titanium
- **B** Aluminum
- **C** Iron

FLIP FOR THE ANSWER

B Aluminum

WHY Aluminum is the lightest by volume of these three. Titanium sits between aluminum and iron, so an equal-size titanium part weighs about 60 percent more than an aluminum one.

STRAIGHT FACE
Aluminum entered the lightweight contest and barely tipped the scale.

SESK.INFO #3105

ENGINEERING

Why is titanium attractive for demanding structures and implants?

- **A** It is lighter than aluminum
- **B** It is stiffer than steel
- **C** It combines strength, low density, and corrosion resistance

FLIP FOR THE ANSWER

C It combines strength, low density, and corrosion resistance

WHY Titanium offers useful strength without the density of steel and resists many corrosive environments. Its compatibility with the body also helps explain its use in medical implants.

STRAIGHT FACE
Titanium brought a strong resume, but kept it lightweight.

SESK.INFO #3106

ENGINEERING

What separates ductile behavior from brittle behavior before fracture?

- **A** Amount of deformation before fracture
- **B** How stiff the material is
- **C** How much stress it takes to break

FLIP FOR THE ANSWER

A Amount of deformation before fracture

WHY Ductility gives visible stretching or shape change before a part breaks. Brittleness means fracture arrives with little plastic deformation, often providing less warning.

STRAIGHT FACE
The ductile wire stayed flexible under pressure.

SESK.INFO #3107

ENGINEERING

What does a material's yield strength mark?

- **A** The highest stress before fracture
- **B** The onset of specified permanent deformation
- **C** The stress at the moment it breaks

FLIP FOR THE ANSWER

B The onset of specified permanent deformation

WHY Below yield, unloading usually lets a part return close to its original shape. Beyond yield, some strain remains after the load is removed.

STRAIGHT FACE
The polite beam knew when to yield.

SESK.INFO #3108

ENGINEERING

Which property describes resistance to indentation, scratching, and local plastic deformation?

A Hardness

B Stiffness

C Toughness

FLIP FOR THE ANSWER

A Hardness

WHY Hardness tests press an indenter into a surface and judge how strongly the material resists. Hardness is useful, but it is not the same property as stiffness or toughness.

STRAIGHT FACE
The indenter made an impression, professionally speaking.

ENGINEERING

What is ultimate tensile strength on an engineering stress-strain curve?

A The stress where yielding begins

B The stress at the moment of fracture

C The maximum resistance reached in tension

FLIP FOR THE ANSWER

C The maximum resistance reached in tension

WHY Ultimate tensile strength is the peak engineering stress in a tensile test. It is different from yield strength, which marks the start of specified permanent deformation.

STRAIGHT FACE
The tensile specimen peaked in its final exam.

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