

Properties of Different Materials

READ ALOUD PASSAGE

Every material has its own set of properties, the characteristics that make it recognizable and useful. You already know the main categories of materials: wood, metal, plastic, glass, rubber, and clay. Properties are what let you tell those categories apart, even with your eyes closed.

Some properties come from your senses. Materials have their own look, texture, and feel. Metal feels cold to the touch, wood feels warmer, and plastic feels somewhere in between. Tapping different materials even produces different sounds, which is one more clue to what something is made of.

Other properties can be tested or measured. Hardness is how much a material resists being scratched or dented. Strength is how well a material holds up against being pulled, bent, or squeezed. Flexibility is whether a material bends without breaking, while elasticity is whether it springs back to its original shape afterward.

A few properties are especially useful for sorting materials. Transparency tells you whether light passes clearly through a material, the way it does through glass. Magnetism tells you whether a magnet will pull on a material, which happens with iron and steel but not with most other metals, like aluminum or copper.

Because so many properties are involved, choosing the right material for a job is rarely simple. An engineer designing a bicycle helmet needs a material that is strong enough to resist a hard knock, light enough not to weigh down a rider's

neck, and workable enough to be molded into a curved shape. Weighing tradeoffs like these, between strength, weight, hardness, and workability, is at the center of how engineers pick materials for anything they build.

Activity 1

Fill in the blank with the correct word from the word box.

WORD BOX

properties hardness transparency magnetism flexibility

1. The characteristics that make a material recognizable are called its _____.
 2. How much a material resists being scratched or dented is its _____.
 3. Whether light passes clearly through a material is called _____.
 4. Whether a magnet pulls on a material is called _____.
 5. Whether a material bends without breaking is its _____.
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Activity 2

Circle True or False for each statement.

1. **True / False** Metal generally feels colder to the touch than wood.
2. **True / False** All metals are attracted to a magnet.
3. **True / False** Glass is transparent, meaning light passes through it clearly.
4. **True / False** Engineers can choose any material for a job without thinking about its properties.

Activity 3

Because / But / So Complete each sentence three different ways.

Engineers weigh tradeoffs between different properties when choosing a material because

Engineers weigh tradeoffs between different properties when choosing a material but

Engineers weigh tradeoffs between different properties when choosing a material so

Activity 4

Each sentence below is a run-on. Rewrite it correctly.

1. Metal is hard and it feels cold and it conducts heat well too.

Correction:

2. Wood can be cut and shaped and it feels warm and it burns easily unlike metal.

Correction:
