

Black Panther

Black Panther is a fictional superhero appearing in American comic books published by Marvel Comics. The character's first appearance in *Fantastic 4* dates back to 1966 in the wake of the Civil Rights and Black Power movement. Black Panther's real name is T'Challa, king and protector of the fictional African nation of Wakanda. His strength, agility and instincts are increased by the consumption of a mystical herb, which, together with the mantle of the panther he has inherited from his father, gives him superhuman powers.

Tradition and technology

Black Panther's country has peculiar characteristics: Wakanda is not only a place where ancient traditions are taken into great account, but also the richest and most technologically advanced nation on Earth thanks to the presence of a special metal called vibranium. The Wakandians mine and use it for a variety of purposes in their everyday lives.

Vibranium

The element vibranium has extra-terrestrial origins: some fragments of an asteroid reached the territory of Wakanda. The impact deeply changed the environment of Wakanda, **enriching** the soil and plant life. Later on, Wakandians also found out that vibranium was

nearly indestructible and could absorb, store and release large amounts of kinetic energy. In the Marvel Universe, the material has been used to make Black Panther's suit and Captain America's shield.

Real or fictional?

Even though the material is only fictional, experts have tried to find similarities with real materials: a rare metallic **ore** called coltan seems to have similar characteristics. When refined, it becomes tantalum, a metal powder that is heat-resistant and that can hold a high electric charge. It is found in large quantities in Congo • and it is a fundamental component of capacitors, which means that it is used for the production of electronic devices we use every day, such as laptops, mobiles and videogame consoles.


Children are exploited in the mining of this mineral. Moreover, illegal mining and trade has given local **warlords** more money to buy weapons for fighting.

bulletproof: *antiproiettile*
to harm: *danneggiare*
ore: *minerale grezzo*
pulse: *battito, impulso*
warlord: *signore della guerra*
to weave: *tessere, intrecciare*

1   **PAIR WORK** Write questions for these answers. Then take it in turns to ask and answer them.

1. He first appeared in Marvel Comics.
2. He is the King of Wakanda.
3. He gets his power by taking a special herb.
4. From his father.
5. It is mined in Wakanda.
6. They discovered it had amazing characteristics.
7. It was used to make Black Panther's suit and Captain America's shield.
8. A metal ore called coltan.
9. In Congo.
10. Common electronic devices.



2  Read this article about the properties of Black Panther's suit. Eight phrases have been removed from of the text. Choose the ones which fit each gap.

- | | |
|---|--------------------------------------|
| a. but only converted from one form into another. | e. which is how springs work. |
| b. which is how batteries work. | f. the potential energy is released |
| c. even though enemies shoot at him | g. but it also builds up energy |
| d. absorb all of the kinetic energy | h. the energy in motion it possesses |

Much of Black Panther's powers come from his vibranium suit: T'Challa has the metal woven into his suit which serves as both a form of offense and defence. The metal is incredibly durable and not only does it protect Marvel's hero, **1.** which is then released in the form of powerful pulses. Shuri, T'Challa's sister, made the armour using nanotechnology. While inactive, the nanobots are stored within T'Challa's necklace; when he activates them, they weave across his body, forming his suit. The suit really is bulletproof: **2.**, T'Challa is not harmed; he actually benefits from being shot repeatedly because each bullet helps charge Black Panther's suit with kinetic energy. Vibranium absorbs that energy which is converted into potential energy while stored in the suit: when it reaches its maximum, **3.** in a radiant and devastating blast.

The principle on which the suit works is that energy can neither be created nor destroyed, **4.**



According to mechanical engineering professor Eric Taleff, Black Panther's suit might have the property of molecularly breaking down the energy it gets when it is hit by bullets fired from a gun, by using a kind of chemical reaction, **5.** or, it might use elastic compression, **6.**

To give a practical example, when someone shoots at Black Panther, the bullet that comes out of the gun is moving and has a lot of momentum. This means that the mass of the bullet is moving at a certain velocity in a certain direction; when it hits the suit, **7.** (the kinetic energy) should bend or deform the armour, because some of that energy is lost through internal friction or dispersed as heat. Vibranium ensures that this does not happen: Black Panther's suit seems to be made out of billions of molecular springs that **8.** and store it as elastic potential energy, just like a compressed spring. Only when the spring is released is the energy transformed into motion again.

Adapted from: <https://screenrant.com/black-panther-armor-wakanda-tech-explained/><https://thedailytexan.com/2018/06/28/the-science-behind-%E2%80%98black-panther%E2%80%99%E2%80%99%E2%80%99-vibranium-suit>

3  Match each word with its explanation.

- | | | |
|---------------------|--------------------------|--|
| 1. Nanobot | <input type="checkbox"/> | a. Energy of mass in motion. |
| 2. Potential energy | <input type="checkbox"/> | b. An object that returns to its shape after being pushed or pulled. |
| 3. Blast | <input type="checkbox"/> | c. The force that resists relative motion between two bodies in contact. |
| 4. Battery | <input type="checkbox"/> | d. A quantity expressing the motion of a body directly proportional to the body's mass and velocity. |
| 5. Spring | <input type="checkbox"/> | e. An extremely small robot. |
| 6. Momentum | <input type="checkbox"/> | f. Energy stored in an object due to its position. |
| 7. Friction | <input type="checkbox"/> | g. A cell that furnishes electric current. |
| 8. Kinetic energy | <input type="checkbox"/> | h. A violent detonation. |

4   **GROUP WORK** Surf the Internet to find more information about coltan mining in Congo and the exploitation of children during its extraction.