

Oh! Hi guys! Squeaks (*la mascota*) and I **were** just **playing** with some **blocks**, you know. It **may** not **seem** like it but the **cities** and **towns**, that **we live in, are** all **built using** the same **rules** as our little **pretend** (*pretendido, imaginario*) **village** over here.



It's just that the real **ones are** bigger and one of our **viewers** (*espectadores/as*), six-year-old **Hannah** from the **UK**, **wanted** to **know** how some of the **things** that **we build stay standing**. So **she sent** us a really great **question**: 'Why **are** _____ **so strong**?'. Excellent **question**!

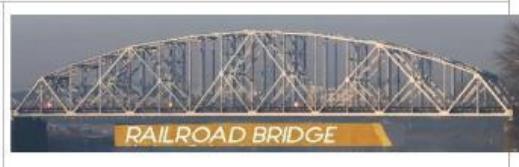
Sometimes when a **road**, or **railroad track** (*vías de tren*), **needs** to **go** across something **big**, like a **river** or a **deep valley**, **experts called** _____ (*ingenieros*) _____ and **build** **bridges** to **do** that **job**.



And **bridges can be** really **busy** (*concurridos*). **Take** for example what's **said to be** the world's **busiest bridge**, the **George Washington Bridge** in New York City.

Look at all those _____ and **trucks**. It **has to be** pretty **sturdy** (*estádi/ resistente*) to **carry** (*cargar, sostener*) so many **people** in **cars** for a **bridge**. To **carry** that much _____ it **has to be built** a **special material** like _____ and _____ but It **takes** more than **tough** (*tof/ duros*) **materials** to **make a strong bridge**. So, **let's look** at how **bridges** _____.

One very **simple kind of** (*tipo de*) **bridge is called** a _____ **bridge**. When we **say simple**, we really do **mean simple**. A **beam bridge** **can be** just a **log** (*tronco*) that you **used to walk** across the **stream** (*arroyo*) or **put** a **long strip** (*tira*) of _____ between two **short blocks**. That's a **beam bridge** too.



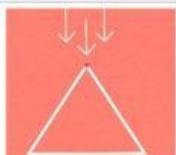
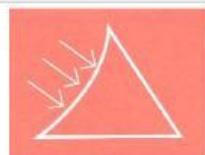
All **bridges can** _____ (*soportar*) a certain amount of **weight** but what **happens** if we **put** too much _____ on a **beam bridge**. Let's **find out**!

It _____! So a **bridge** that **carries** **trucks** and **cars**, which **are** very **heavy**, would **have to be stronger** than a **bridge** that **carries** _____ or **people** on foot, which **are** **lighter**. So, **how do we make stronger bridges**?

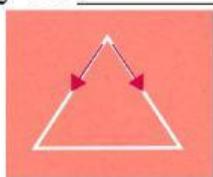
Well, over time, **people have learned** that certain **shapes can be used to make stronger bridges**. **Take a look** at this _____ **bridge** (*puente ferroviario*). It **has to be strong** because It **carries** **trains**. What _____ do you **see**? That's right! _____ and that's not by **accident**. The fact is **triangles are** really **strong shapes for building**.



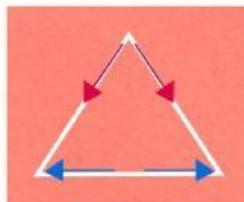
If you **put** _____ on one **side** of a **triangle** It _____ (*doblar, curvar*) but if you **put** _____ on its **point** It **keeps** its _____.



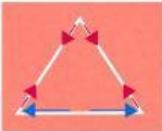
That's because the two **sides** ... and the **bottom gets** **pushed** **down** by the ...



... and the **bottom gets** **stretched out** (*estirar*) to both **sides**.

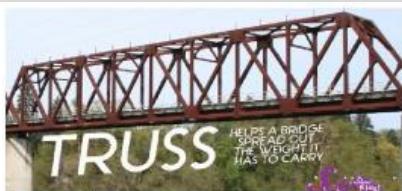


Each side **feels** the _____ but none of them **bends** and this **makes** the _____ a really **sturdy** (*estádi/ resistente*) and **stable** _____.

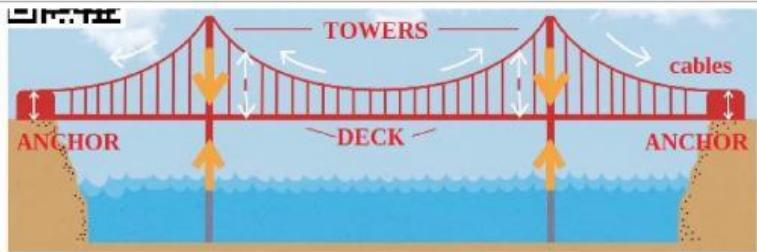


This **is** why you'll **see** lots of **triangles** in _____ both above the **part** that **you** actually **travel** on, **called** the **deck** (*cubierta*), **and** below it. The **long** **string** of **triangles** that **you** **see** in a **bridge** **is called** a **truss** (*träs/ entramado, cercha*). **Trusses** (*träsis/*) **help** a **bridge** **spread out** (*extender, repartir*) the _____ that **It has to** _____.

But not all **bridges** **are made** of **trusses** (*träsis/*). If a **bridge** **has to cross** a really **wide** (*ancho, largo*) **body** of _____ **It might be** too **difficult** or **expensive** to **build** a _____ **bridge** so **engineers** **design** another **kind** of **bridge** **called** a **suspension bridge**. The **Golden Gate Bridge**, in **California**, **is** a great **example** of a _____ **bridge**.



Suspension bridges **work** by **using** a _____ **called** **tension**. **Tension** **It's** just **pulling** something **tight** (*ajustado*). **Suspension bridges** **are made** of a **deck** (*cubierta*) that's **hung** (*colgado*), or **suspended**, from **thick** (*gruesos*) _____ that **stretch** (*estiran*) from one **side** of the **bridge** to the other. These **cables** **are supported** by **tall towers** and then **are held down** (*presionado*) **tightly** (*apretadamente*), or **anchored** (*ankēd/ anclado*), on both **ends**. **Suspension** _____ **are** **strong** because the **force** on the **bridge** **gets spread out** (*extender, repartir*). The **weight** of the **cars** or **trains** or **horses**, whatever **is traveling** across **It**, _____ on the **cables** **creating tension**.



Those _____ then **pull down** on the **towers** and also _____ on the **anchors** (*ankēs/ anclajes*), on **either** **end** of the **bridge** to **hold up** (*mantener*) the **deck** (*cubierta*) **I can go** on **and** on about all **kinds** of **clever** _____ but basically **bridges** **are** **strong**. Not only because they're _____ of **strong** **materials** but also because of the **smart** **designs** **dreamed up** (*soñado*) and **planned** by _____.

So thanks for **asking**, **Hannah**, and thank **you** for **hanging out** with (*pasando el rato con*) us at **Scishow kids**. See **you** next time.