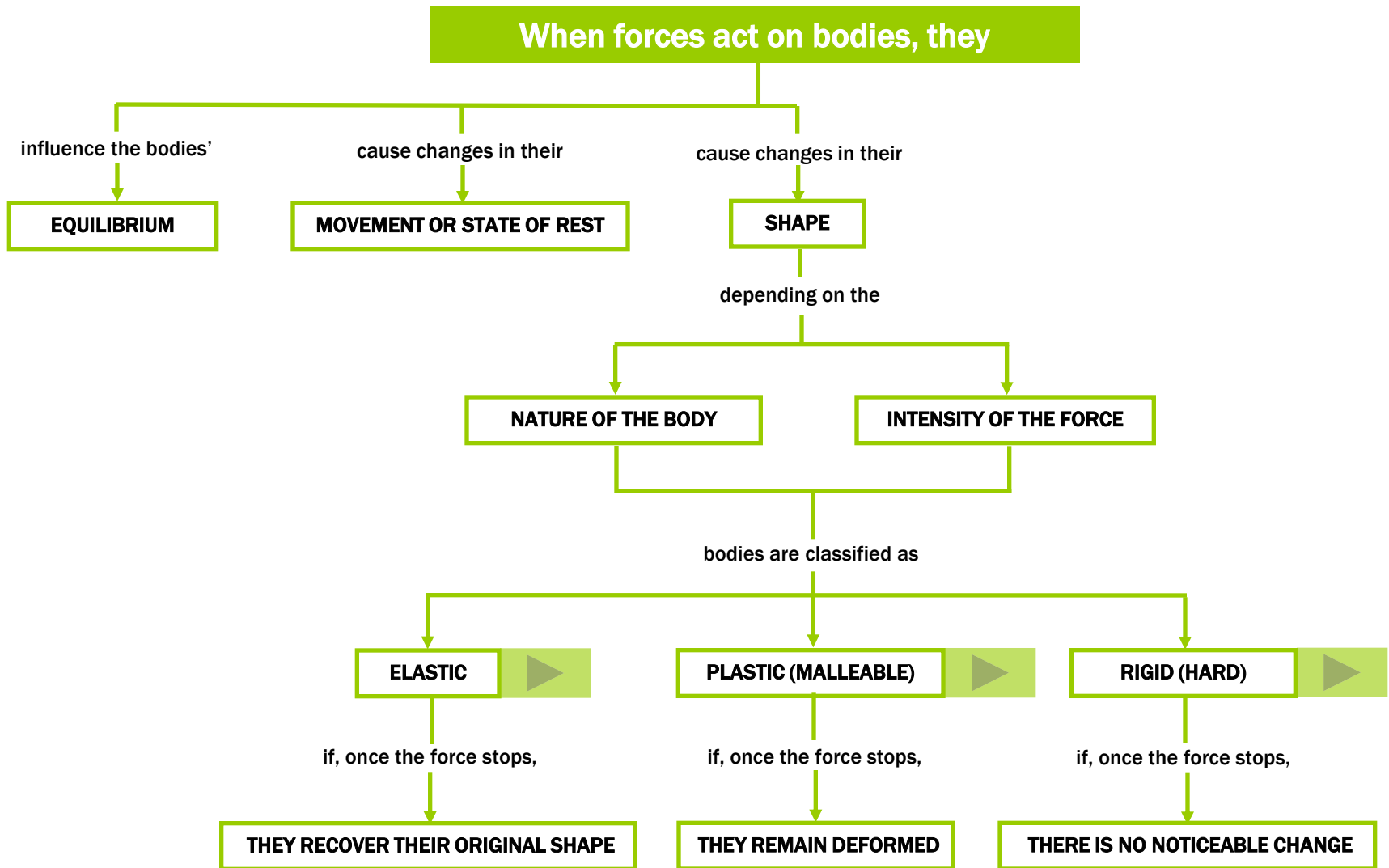


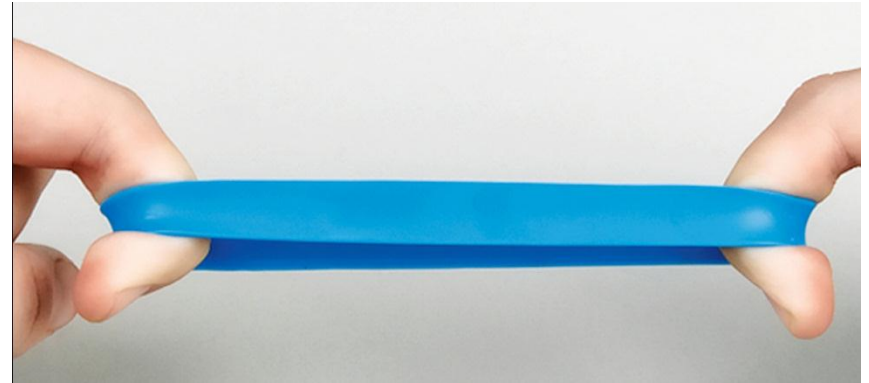
Forces and their effects



Forces and their effects

A spring is an example of an **elastic** body. Rubber bands and balloons are other examples. However, there are no perfectly elastic bodies. For example, if you pull very hard on a spring, you'll change its shape permanently, and it will no longer behave like an elastic material.

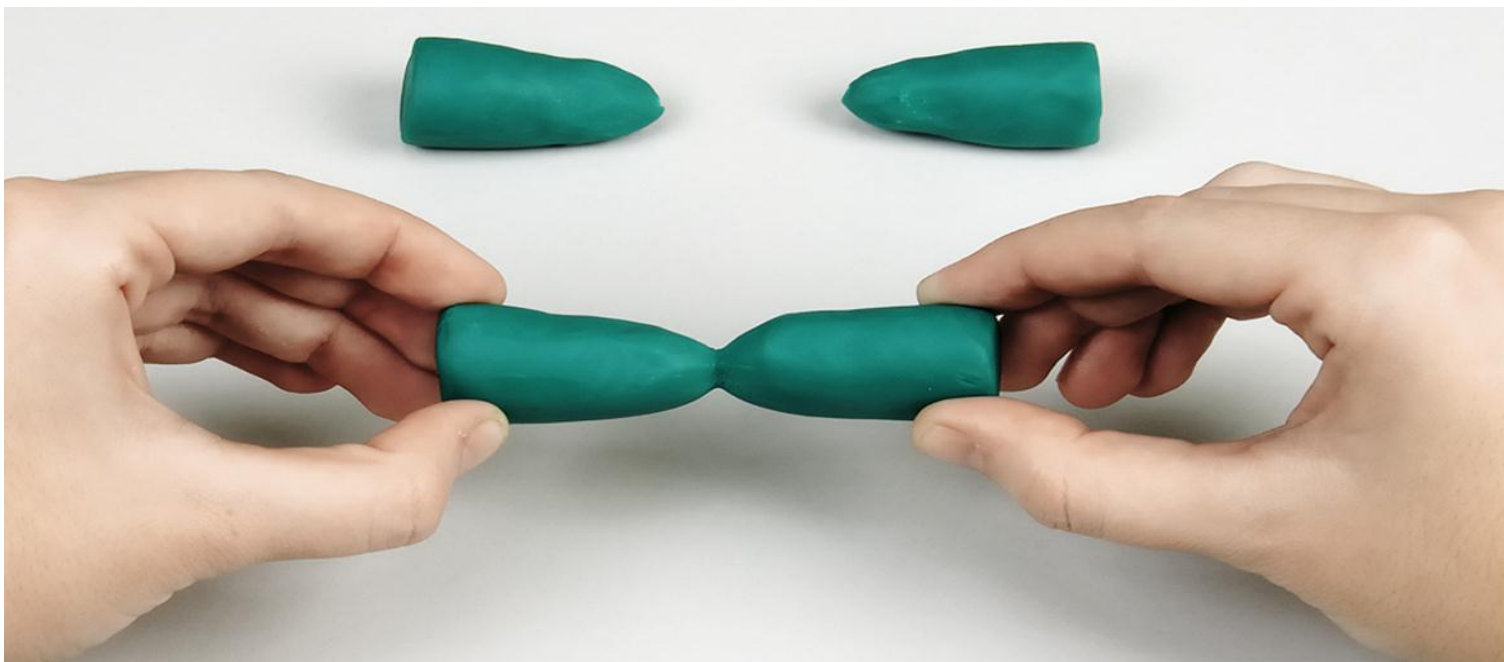
When this happens, we say that the spring's elastic limit has been exceeded (this is shown in the photo). The body will now behave like a malleable material.



Forces and their effects

Malleable materials remain deformed after a force has been applied. Plasticine is an example of a malleable material.

Just as there are no perfectly elastic bodies, there are no perfectly malleable bodies. If we apply a strong enough force, they break. This is a characteristic shared by all bodies, and the maximum force we can apply without breaking them is called the **breaking limit**.



Forces and their effects

We cannot observe deformations in **rigid, or hard**, materials, like the rocks shown in the photo on the right.

However, these bodies also have a breaking point: all we have to do is apply a strong enough force. Some bodies, like glass, have a very low breaking point. They can be broken using a weak force. We call these **fragile** materials.



Forces and their effects

1. Cars used to be made of hard materials, but now they are now made of more malleable materials, and engineers perform careful analyses on the deformations that would occur in the hard components of the car in the case of an accident in order to prevent passengers from being injured:
 - a) Why do you think this is?
 - b) How do you think the human body behaves when small forces are applied to it? And when it is hit very hard?



Forces and their effects

2. What type of body does a spring become when its elastic limit is exceeded?

• Elastic.

• Plastic.

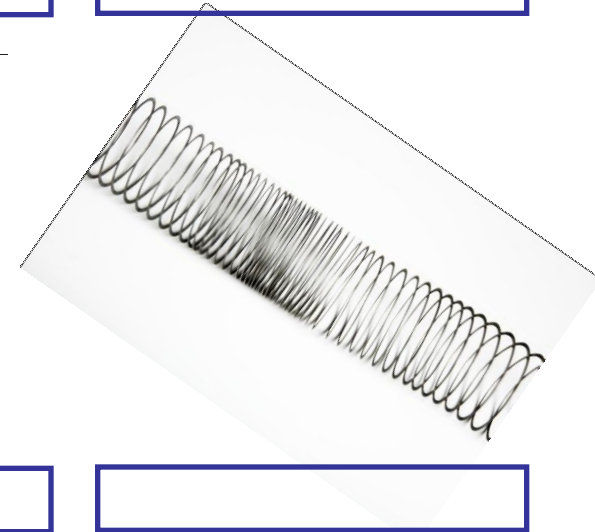
• Rigid.

3. Classify the bodies on the right as elastic, plastic and rigid, considering how or whether they change shape when a force is applied to them.









Forces and their effects

4. Analyse the behaviour of the trees in the photo according to how or whether they change shape when a force is applied to them.

