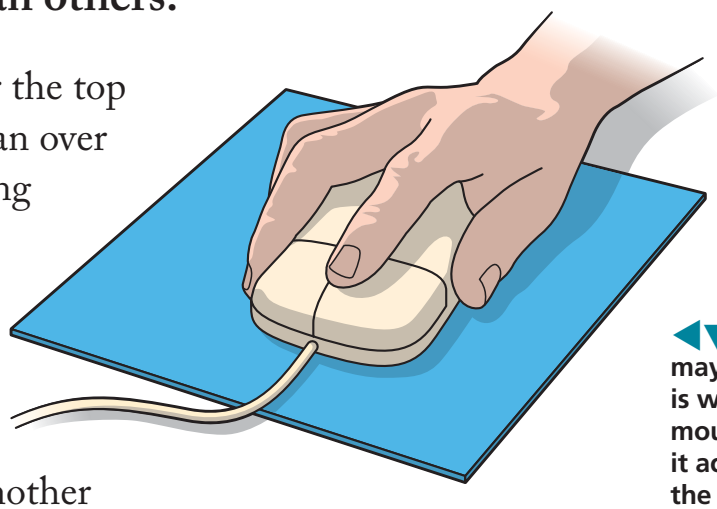
# 3 Which materials grip best?

**Different materials grip each other by different amounts. This is what makes some materials more slippery than others.**

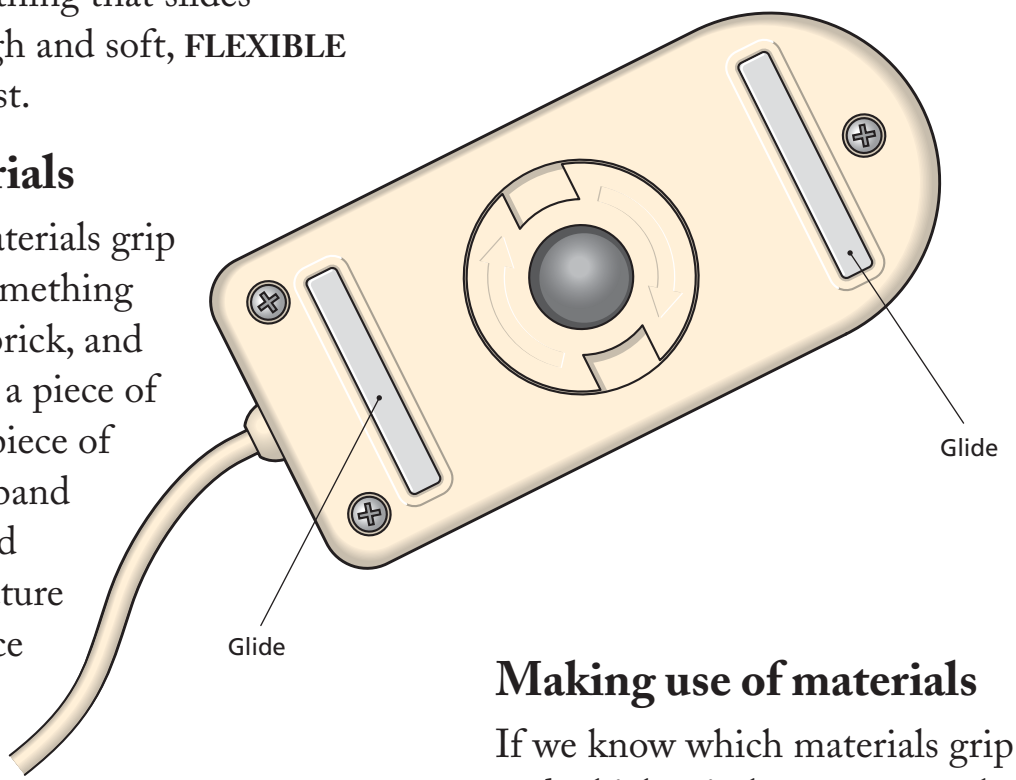
You can **SLIDE** your hand over the top of a desk much more easily than over a rubber mat. If you are pressing down by the same amount each time, the stickiness (friction) between objects changes with each material you slide your hand over. A mouse on a mouse mat is another example of something that slides (Picture 1). Rough and soft, **FLEXIBLE** materials grip best.



**(Picture 1) You may think the ball is what causes a mouse to slide, but it actually slides over the mouse mat on glides of plastic.**

## Testing materials

To test which materials grip well, you need something heavy, such as a brick, and a piece of carpet, a piece of vinyl flooring, a piece of rubber, a rubber band or sticky tape, and a forcemeter (Picture 2). Cut out a piece of carpet, wrap it around the underside of the brick and hold it in place with the rubber band or tape. Now pull the brick using a forcemeter and read the force needed just to get it to move. Repeat this test replacing the carpet with vinyl, and then rubber.




## Making use of materials

If we know which materials grip best and which grip least, we can plan to use them where they will be most useful. For example, sticky rubber might be better than slippery plastic for a floor tile. You are less likely to slip and fall over on a surface with more grip.



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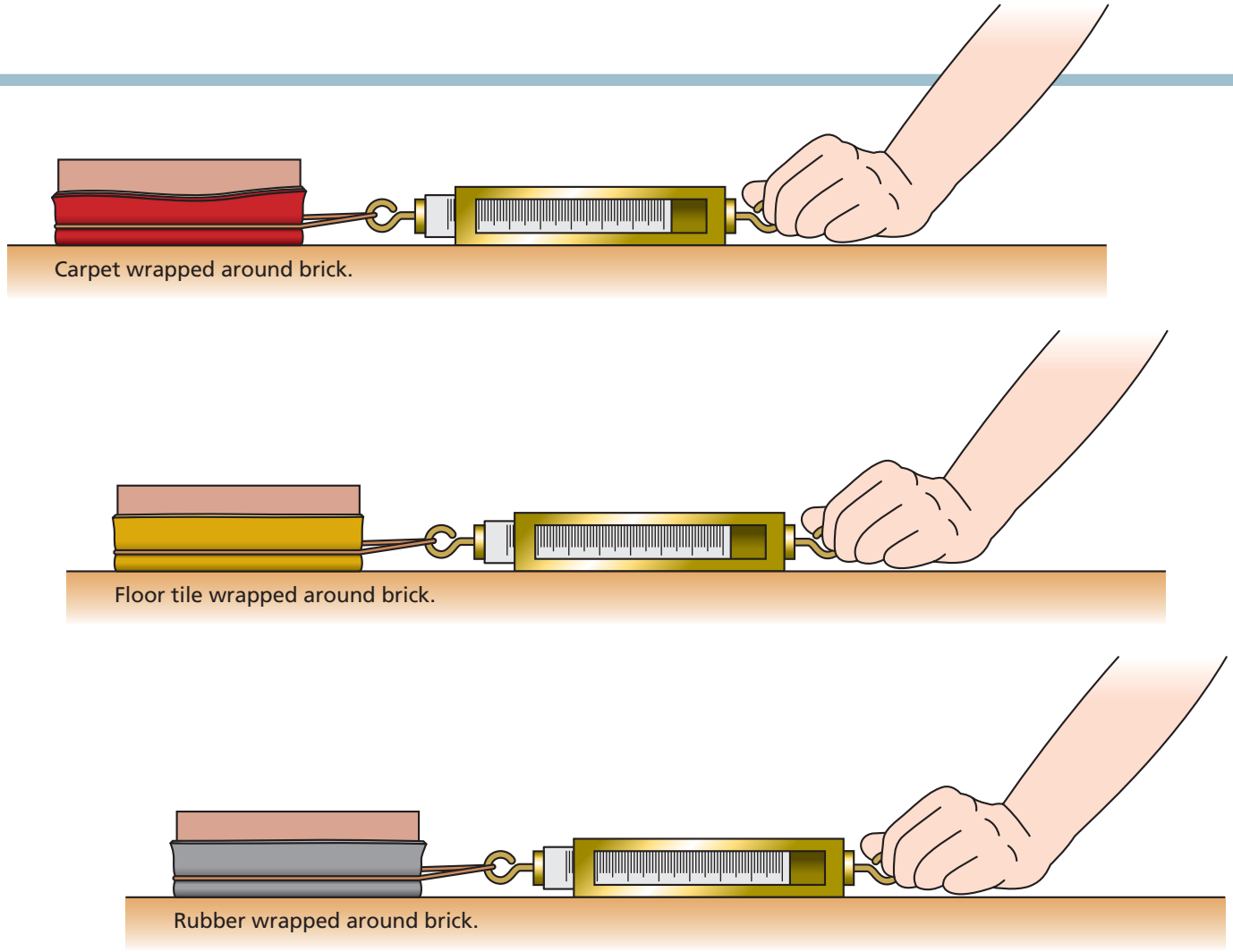


▲ **(Picture 2) You can test the friction of various materials by wrapping them around a brick. Always drag the materials over the same surface and at the same speed.**

Using different materials can have big effects in other ways, too. For example, by changing the materials of the ball and the shoe, the way a ball is controlled when kicked can be changed (Picture 3). This will affect how a game is played.

▼ **(Picture 3) You can control the way a kicked ball leaves the shoe by changing the materials used to make the shoe and the ball. Some materials have less friction between them.**

## Summary

- **The amount of friction depends on how rough or flexible the material is.**
- **Materials with the smoothest surfaces have the least grip.**
- **Materials with the roughest surfaces have the best grip.**