

TESTING SPORT SURFACES

If you have ever watched a sporting event with horses, either on television or in person, you may have noticed how the surface they are walking or running on isn't always like the flat, hard surfaces we are used to running on. Surfaces for sports horses are designed and prepared for them, a bit like athletics running tracks are designed and built for human runners.

The top of the surface used in a show jumping competition is prepared to make it soft. It may look like a layer of sand that is loose, like on a dry beach.

Q. What is it like if you run on a soft sandy beach?

A. Exhausting!

This is because when we push off with our feet to run the loose sand moves away from our foot.

In a show jumping arena the top layer is soft to cushion the horses' hooves, but there needs to be a firmer layer underneath to push off from. This will stop them getting tired and they will be able to spring off the surface better.

[Watch The Perfect Jump video to find out about how engineers test surfaces for horse jumping](#)

What you will need:

Box or tray of dry sand big enough to step or jump into with both feet

Thick foam mat to fit inside box

Garden hand rake or fork

A volunteer to act as your 'horse'



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What to do:

Set up different layers in your box to test how they feel when you walk and jump on them.

The three combinations to try are:



1. Foam mat on bottom, hard packed sand on top



2. Foam mat on bottom, loose sand on top



3. Loose sand only

Don't tell your volunteer which combination of layers there are each time:

- Set up the box as shown in the picture. To create hard packed sand, use the rake or fork to pat the sand down and smooth the top. To create loose sand, use the rake or fork to break up the sand and ripple the top layer.
- Ask your volunteer to step on to the surface, then jump on it. Ask them how it feels.
- Set up the box with the next combination and ask your volunteer to step on and jump again. Can they feel any difference?
- Set up the box for the third time and ask your volunteer to step on and jump. How does it feel this time?

Once your volunteer has tested all three combinations can they guess which ones had the foam layer in? Which one would they prefer to run and jump on?

Further Experiment ideas:

- Test other layer combinations, e.g. two or three layers of foam with packed or loose sand.
- Stand the box on grass or hard floor (e.g. concrete, patio), does it feel different on the surfaces?
- Is there a difference in comfort for little people compared to bigger people?

