

Main subject:

Science (physics)

Linked subjects:

1. Maths 2. Design and technology

Year

9

Dancing with the stars

The aim of this extension task is to:

Investigate which person in your family would cause the most pain if they stepped on you while dancing with you. Design new shoes for them to reduce their pressure.

Why Not?
It's just for fun!

Context of task:

Dancing with the stars is a popular ball room dance programme in UK. Unfortunately in certain gyms you are not allowed to go in with dancing shoes (or even normal shoes!) as the floor can get damaged. This task links this with pressure.

You need

Sheets of graph paper, a weighing scale, internet, the collaboration of your family.

**Questions / Issues to address:**

1. Make a **table of results** with total surface area in m^2 , mass in Kg, weight in N.
2. On a graph paper draw the outline of the shoes that each person in your family is wearing on that day—**work out the surface area** of both of their shoes together in cm^2 . **Convert** to m^2 (Use internet for help)
3. **Measure the mass** of each person with a weighing scale and record. **Covert** Stones and pounds into Kilograms (Use internet for help).
4. **Work out the pressure** that each person exerts on the flour while standing up with both feet in the ground and identify which would cause the most damage if they stepped on you.
5. Now look at the **material of each sole**. Research on the internet which material is the most stiff and which is the most flexible. Suggest which material may produce a higher or lower pressure and explain why using the idea of surface area.
6. **Redesign their shoes** so that they produce the least pressure on the floor with labels to explain in detail your choice. Don't forget to be creative!

**Expectation**

For your design you can make :

- a poster ,
- a slide show
- a video.

Deadline:**Note to students:**

It is not essential, but you are encouraged to extend this task into an area of your own