Towards Mastery:

**Calculation Checklist**

1. Write the values you’re given.
2. Check the values are in SI units.
3. Write the equation you will use.
4. Substitute in the values you know.
5. If necessary, re-arrange the equation.
6. Calculate your answer.
7. Write your answer – don’t forget the units!

Elastic Potential Energy (EPE) Calculations

[Learning]

*This is what you really need to be able to do – use the equation exactly as it is given to you, substitute in the values you are given in the question and calculate the kinetic energy. Show all your working out.*

1. Calculate the EPE of a spring with spring constant 5N/m and extension 2m.
2. An elastic band has a spring constant of 4N/m and an extension of 0.4m. Calculate the EPE.
3. A bungee cord is stretched 0.2m and has a spring constant of 0.3N/m, what is the EPE in the cord?
4. A string stretches 0.2m, the string has a spring constant of 4N/m. Calculate the EPE.
5. Calculate the EPE of a spring with spring constant 2N/m and extension 5m.
6. An elastic band has a spring constant of 3N/m and an extension of 0.5m. Calculate the EPE.

[Challenge]

*These are the more difficult questions – you will need to substitute and then rearrange these equations – if you can do these then you are really starting to grasp these calculations. Show all your working out.*

1. Calculate the spring constant of the spring if a spring stretches 0.2m and has 20J of EPE.
2. A bungee cord stretches 1m and has 1000J of EPE, what is the spring constant?
3. A spring has a spring constant of 10N/m, the spring has 200J of EPE, calculate the extension of the spring?
4. What is the extension of a spring that has 500J of EPE and a spring constant of 2N/m?
5. A rope stretches 2m and has 500J of EPE, what is the spring constant?
6. A spring has a spring constant of 2N/m, the spring has 2000J of EPE, calculate the extension of the spring?

[Extreme]

*These are the most difficult questions – you will need to convert the units, substitute your values and then rearrange the equations – if you can do this you are well on your way on the journey to mastery of these calculations. Show all your working out.*

1. Calculate the EPE stored in a spring stretched by 5cm with a spring constant of 10N/m.
2. What is the EPE of a spring with spring constant 100kN/m and an extension of 10mm?
3. A bungee cord is stretched from 100cm to 150cm, it has 1kJ of EPE when it is fully stretched. Calculate the spring constant of the bungee.
4. What is the extension of spring with spring constant 0.2kN/m and EPE of 0.2kJ?
5. A spring is stretched from 150mm to 160mm, it has 0.2kJ of EPE when it is fully stretched. Calculate the spring constant of the bungee.