11-14 Energy Stores

The Main Points

- Energy **allows** things to happen, it does **not** make things happen. Like money allows you to buy food, it doesn't buy the food.
- Energy is stored in an **energy store.**
- Energy can be **transferred** from one store to another.
- Energy has the units of **Joules (J).**
- There are 8 types of energy:
    - **Gravitational potential energy:** energy from being in a gravitational field. This generally translates to the higher the object, the more its gravitational potential energy is filled.
    - **Kinetic energy:** the energy of moving objects
    - **Elastic potential energy**: the energy gained through deformation, like the compression of a spring.
    - **Nuclear energy:** the energy released during a nuclear reaction
    - **Electrostatic energy:** the energy of charges stuck to a surface, like a balloon.
    - **Magnetic energy:** the energy stored in a magnetic field, from a magnet.
    - **Chemical energy:** the energy released in chemical reactions
    - **Thermal energy:** the energy in warm objects. The hotter the object, the more thermal energy it has.
- Energy is **not created,** is **not lost**, it is **transferred.** All energy must be accounted for, this is the law of **conservation of energy.**
- Energy can be **dissipated** to its surroundings. The energy is not lost, it is now no longer stored in a **useful** energy store.

Teacher Quarter Briefing

- Introduction: coming soon
- Practice: coming soon
- Review: coming soon
- If you want to go further: https://isaacphysics.org/pages/covid19_gcse_archive?stage=all#34

Class Questions Notes

The worksheet can be printed either in full, or in cloze text form (where the red text is missing, and students can complete these blank spaces after class discussion). The online version of the notes requires the appropriate text to be dragged to the right place in the sentences.

1. This question is about getting students to untangle the use of energy in every day language and the use of energy in physics. Part b for example highlights the fact that climber has run out of *chemical energy,* but this has been transferred to *gravitational potential energy* instead. It is a multiple choice question.
2. This is getting the students comfortable with the different types of energy stores.
3. This question aims to get the students to think about the different energy stores in different situations, from the starting point to the end point.
4. This question aims to highlight how conservation of energy through showing that the total amount of chemical energy stored in the battery is now in the thermal energy store of the water. The last part of the question asks the students to continue the pattern to find out how much energy would be needed to further increase the thermal energy of the water.
5. This question is getting to practise transferring energy from one store to another, while highlighting conservation of energy.
6. Again, this question is similar to 5, except this time there are 2 energy stores that the energy goes to.
7. This question shows how energy can be transferred to an energy store which is not very useful to the situation.
8. This question aims to familiarise students to the different energy stores, while getting them comfortable with the idea of efficiency of a system.

Homework Question Notes

These questions have a very similar form to the questions in the class task, so students can refer back to their earlier answers to help.

1. This question is very similar to question 2 of the class questions. It is about getting students familiar with the different types of energy stores.
2. This question asks students to identify from where the energy comes from and where it goes to.
3. This question is getting the students to think about the simple equation of conservation of energy: energy before = energy after
4. This question is similar to question 5 from the class questions. It is a numerical energy conservation question.
5. This question asks students to calculate how many chocolate bars they would need to climb Ben Nevis.
6. This is another numerical question asking students how much energy is in each store.
7. A numerical question looking at heat dissipation.
8. Another numerical question looking at calculating energy in different stores and energy dissipated.