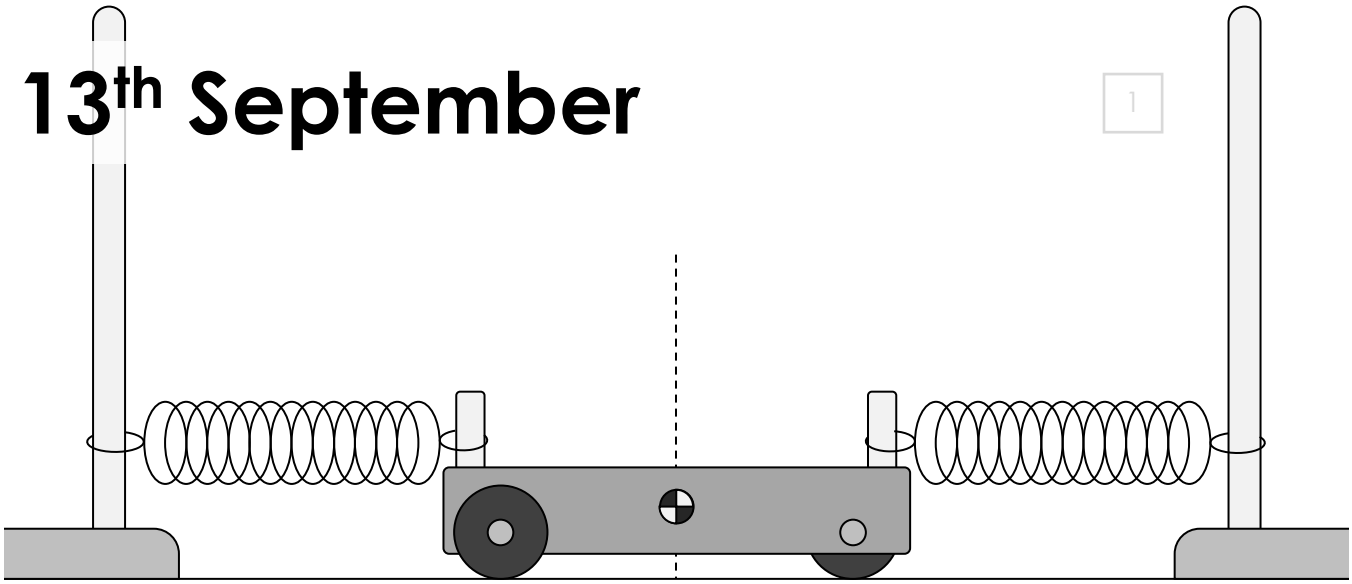
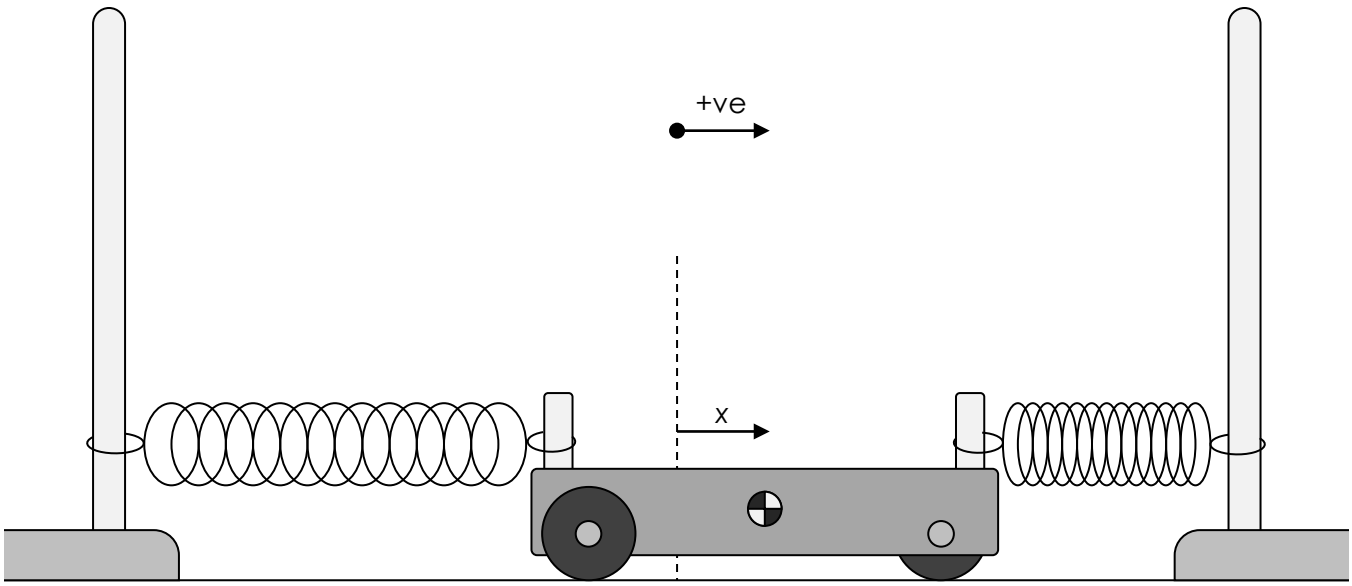
13th September



1. A wooden trolley is connected to two identical springs which are attached to two retort stands held firmly in place, as shown above.

   The trolley is then displaced to the right by a displacement x, as shown below.



   a. At the instant the trolley is released, state the direction of the **resultant force** on it

   b. State the direction that the trolley would initially **accelerate** in

   c. As the positive displacement from the central point decreases, describe how the acceleration of the trolley **changes**

   d. Once the trolley moves to the left of the initial rest position, state the direction of the **acceleration** of the trolley

13th September

e. When the trolley is pulled to the right and about to be released, describe how the energy of the system is **stored** and state the **equation** used to calculate this

f. State the value of the displacement where the **kinetic energy** of the trolley is at a **maximum** value

Once the trolley is released it oscillates about the central rest position.

Below is a graph showing how the energy is related to the displacement of the trolley. The total energy of the system, E_T, is constant (assuming no losses to the surroundings due to friction and air resistance) and the kinetic energy, E_K, has been plotted.

g. Sketch a line to show how the **energy** described in part e. changes with respect to displacement