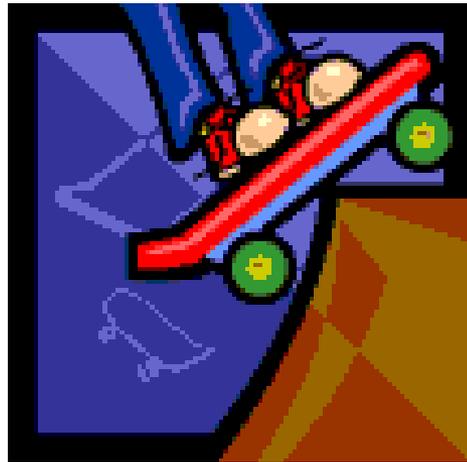


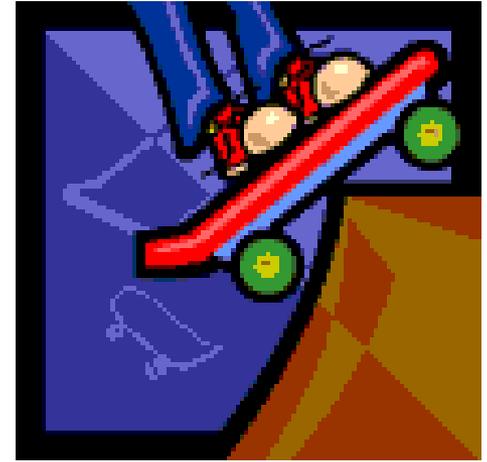
Big Ideas about Conservation of Energy



By Laura Zinszer

Conservation of Energy Means:

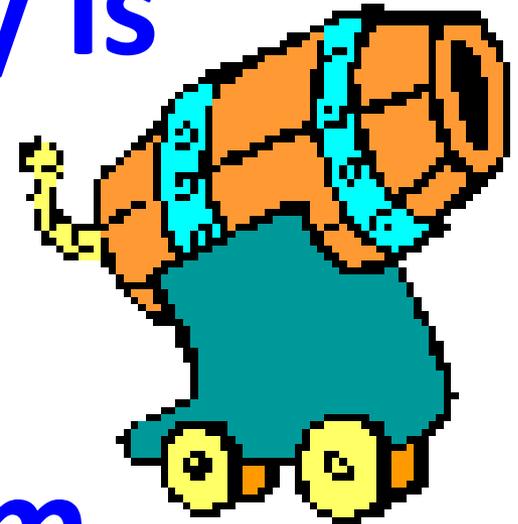
1) Energy cannot be lost or gained... it can only be transformed or transferred within a system.



2) An Energy Transformation occurs when one type of energy is changed into another type of energy.



3) An Energy Transfer occurs when energy is moved from one object to another object or one system to another system.



**What are the
energy
transformations
and energy
transfers with
Humpty Dumpty?**



Eg →

**Humpty Dumpty
has stored **Eg**
when he is sitting
on top of the wall.**



Eg → **Ek**

The **Eg** is
transformed into
Ek as he falls.



$E_g \rightarrow E_k \rightarrow$ Thermal

Energy
(friction)

Finally, the E_k is transferred to the ground as thermal energy (friction) when he lands. 😞h no..



$E_g \rightarrow E_k \rightarrow$ Thermal
Energy

(friction)

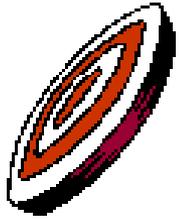
Remember, the Total Energy did NOT change!! The Energy before HD fell was the same after he hit the ground.



What are the energy transformations and energy transfers with the archer?



Elastic EEL →

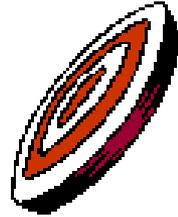


The archer transfers elastic potential energy to the bow when it is pulled back.

Elastic E_{EL} \rightarrow E_K



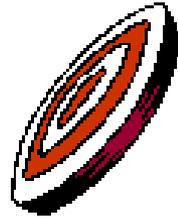
When the bow is released, the energy is transferred to the arrow and transformed into E_K .



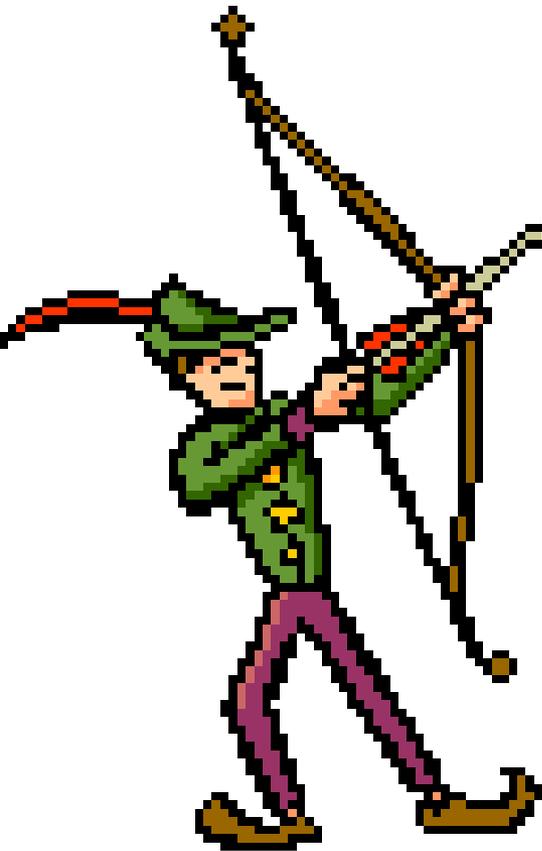
Elastic $E_{EI} \rightarrow E_k \rightarrow$ Thermal
Energy E_{Th}



Finally, the arrow
transfers the energy to
the target where it hits
& becomes Thermal
Energy due to friction.

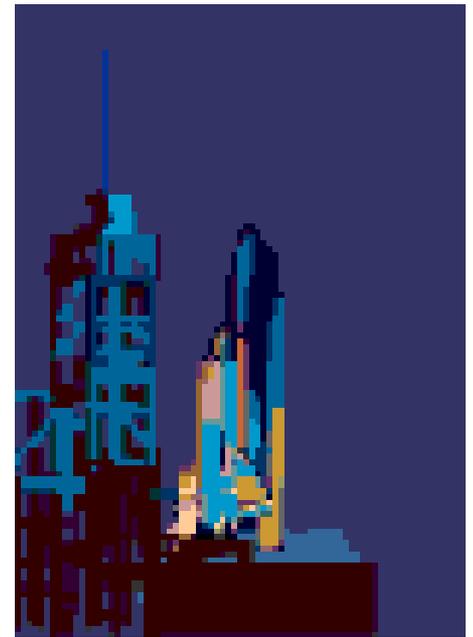


Elastic $E_{EI} \rightarrow E_k \rightarrow$ Thermal
Energy E_{Th}



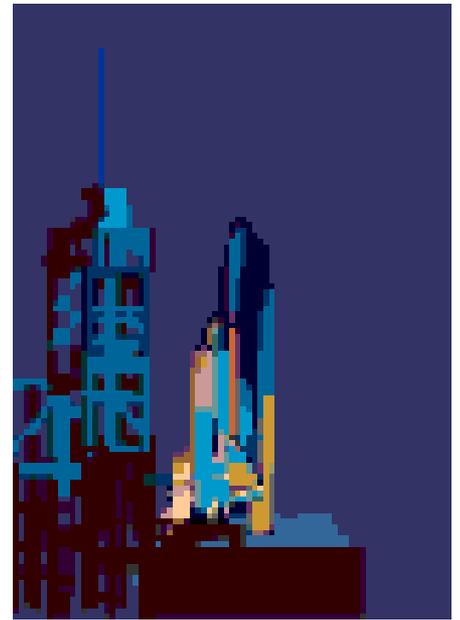
Remember, the Total Energy did not change. The Elastic Energy at the beginning matched the Thermal Energy at the end.

What are the energy transformations and energy transfers with the launch of the Space Shuttle?



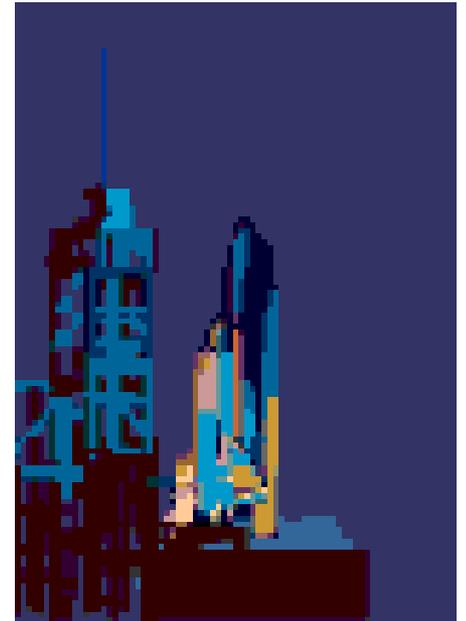
Chemical E_{ch} →

**The space shuttle
rocket has stored
Chemical PE in its
fuel as it sits on
the launch pad.**



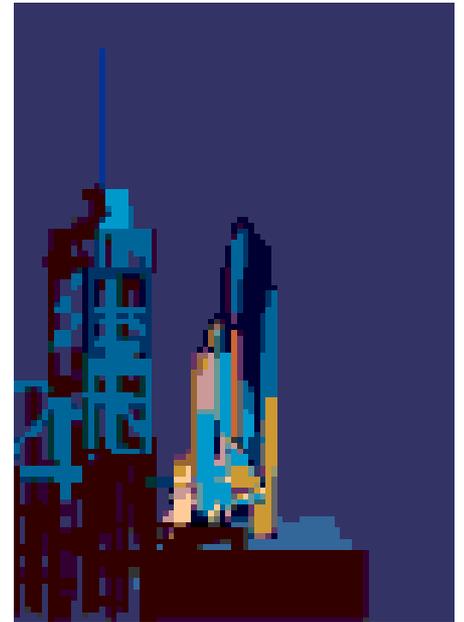
Chemical Ech → **Eth**

The burning fuel is now transformed from **Chemical Energy** into **Thermal Energy** as the rocket ignites.



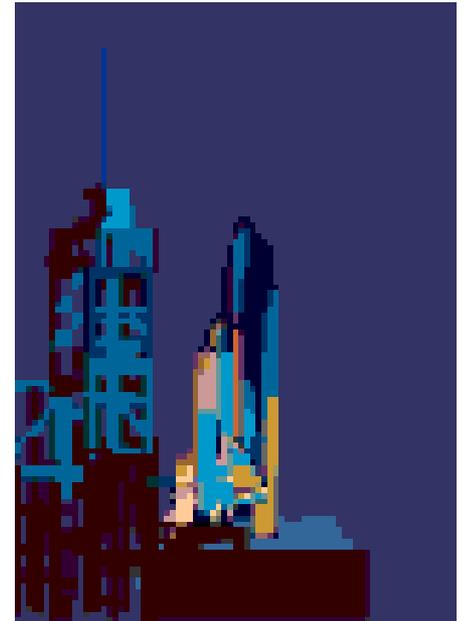
Chemical E_{ch} → E_{th} → E_k

The **Thermal Energy** is transformed into **Kinetic Energy** as the rocket lifts off.



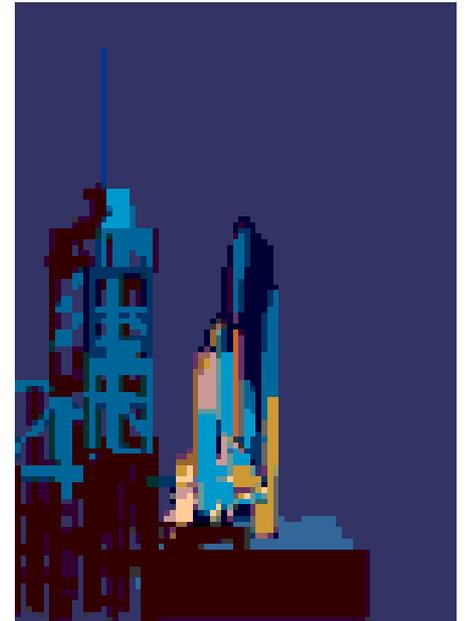
Chemical E_{ch} \rightarrow E_{th} \rightarrow E_k \rightarrow E_g

Finally, the **Kinetic Energy** is transformed into **Gravitational Potential Energy** as the **Rocket** gains altitude.



Chemical E_{ch} \rightarrow **Eth** \rightarrow **Ek** \rightarrow **Eg**

Remember, the Total Energy in this system did not change as the rocket was launched. One type of energy was transformed into another type of energy.



In your notebook:

1st define “Conservation of Energy.”

**2nd explain the difference
between energy transformations
and energy transfers.**



What would be the energy transformations in a wind up toy?