

# Energy Skate Park

**Spoken Tutorial Project**

**<http://spoken-tutorial.org>**

**National Mission on Education through ICT**

**<http://sakshat.ac.in>**

**Meenal Ghoderao**

**IIT Bombay**

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# Learning Objectives



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- ▶ Demonstrate Energy Skate Park, PhET Simulation



# System Requirement



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- ▶ **Ubuntu Linux OS v 14.04**



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- ▶ **Java v 1.7.0**



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- ▶ **Ubuntu Linux OS v 14.04**
- ▶ **Java v 1.7.0**
- ▶ **Firefox Web Browser v 53.02.2**



# Pre-requisites





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- ▶ **Learner should be familiar with topics in high school Physics**



# Learning Goals



# Learning Goals

- ▶ **About law of conservation of energy**



# Learning Goals

- ▶ About law of conservation of energy
- ▶ To show Pie chart and Bar graphs for energy changes



# Learning Goals

- ▶ About law of conservation of energy
- ▶ To show **Pie chart** and **Bar** graphs for energy changes
- ▶ To use **Energy vs Position** graph to show the energy value at a particular position



# Learning Goals



# Learning Goals

- ▶ To change location and observe the energy changes



# Learning Goals

- ▶ To change location and observe the energy changes
- ▶ About change in energy due to change in mass and friction





# Law of Conservation of Energy



# Law of Conservation of Energy

- ▶ Energy can neither be created nor destroyed



# Law of Conservation of Energy

- ▶ Energy can neither be created nor destroyed
- ▶ It can only be converted from one form to another



# Law of Conservation of Energy

- ▶ Energy can neither be created nor destroyed
- ▶ It can only be converted from one form to another
- ▶ The total energy before and after the transformation is conserved



# Potential Energy



# Potential Energy

- ▶ **Potential energy** is the energy possessed by an object by virtue of its position



# Potential Energy

- ▶ **Potential energy** is the energy possessed by an object by virtue of its position
- ▶  **$PE = mgh$**   
 $m$  = mass of object (kg)  
 $g$  = acceleration due to gravity ( $m/s^2$ )  
 $h$  = height (m)



# Kinetic Energy





# Kinetic Energy

- ▶ **Kinetic energy** is the energy possessed by a body due to its motion



# Kinetic Energy

- ▶ **Kinetic energy** is the energy possessed by a body due to its motion
- ▶  $KE = \frac{1}{2}mv^2$   
m = mass of object (kg)  
v = velocity (m/s)



# PhET Simulation-Link



# PhET Simulation-Link

<https://phet.colorado.edu>



# Assignment



# Assignment

- ▶ Select **Double Well** track from tracks menu and observe the energy changes



# Assignment

- ▶ Select **Double Well** track from tracks menu and observe the energy changes
- ▶ Compare the energy changes in **Double well track with Double Well Roller Coaster Mode**



# Assignment





# Assignment

- Find the changes in the thermal energy



# Assignment

- ▶ Find the changes in the thermal energy
- ▶ Give an explanation



# Assignment

- ▶ Find the changes in the thermal energy
- ▶ Give an explanation
- ▶ **Hint:** Right click on the track and select Roller Coaster Mode



# Assignment



# Assignment

- ▶ Using **Tracks** box,  
Create tracks and observe the  
change in energies



# Summary



# Summary

- ▶ How to use Energy Skate Park, PhET simulation



# Summary





# Summary

- ▶ About law of conservation of energy
- ▶ To show **Pie chart** and **Bar** graphs for energy changes
- ▶ To use **Energy vs Position** graph to show the energy value at a particular position



# Summary



# Summary

- ▶ To change location and observe the energy changes
- ▶ About change in energy due to change in mass and friction



# About the Spoken Tutorial Project

- ▶ Watch the video available at [http://spoken-tutorial.org/What\\_is\\_a\\_Spoken\\_Tutorial](http://spoken-tutorial.org/What_is_a_Spoken_Tutorial)
- ▶ It summarises the Spoken Tutorial project



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- ▶ It summarises the Spoken Tutorial project
- ▶ If you do not have good bandwidth, you can download and watch it



# Spoken Tutorial Workshops

## The Spoken Tutorial Project Team

- ▶ Conducts workshops using spoken tutorials
- ▶ Gives certificates to those who pass an online test
- ▶ For more details, please write to [contact@spoken-tutorial.org](mailto:contact@spoken-tutorial.org)



# Forum for specific questions

- ▶ Do you have questions in **THIS Spoken Tutorial?**
- ▶ Please visit  
<http://forums.spoken-tutorial.org>
- ▶ Choose the minute and second where you have the question
- ▶ Explain your question briefly
- ▶ Someone from our team will answer them



# Acknowledgements

- ▶ This project is partially funded by  
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National Mission on Teachers and  
Teaching**





# Acknowledgements

- ▶ Spoken Tutorial Project is a part of the Talk to a Teacher project
- ▶ It is supported by the National Mission on Education through ICT, MHRD, Government of India
- ▶ More information on this Mission is available at

<http://spoken-tutorial.org/NMEICT-Intro>

