**Noteguide for Work - Videos 5A Name**

Example - Fred O’Dadark exerts 13.2 N on a rope that makes a 32o angle with the ground, sliding a sled 12.5 m along the ground. What work did he do?

**Work and Weight Example** – Joe Dadi lifts a 5.0 kg mass 2.5 m. What work does he do?

W

F

d

m

μ

F = mg (lifting)

F = μmg (dragging)

W = Fd

**Work and Friction Example** – Herman Leftur drags a 150 kg sled 45 m across a lake where the coefficient of kinetic friction is 0.12. How much work does he do?

W

F

d

m

μ

F = mg (lifting)

F = μmg (dragging)

W = Fd

(Do the whiteboards on the back)

Whiteboards (simple work)

|  |  |
| --- | --- |
| 1. Jane Linkfence does 132 J of work lifting a box 1.56 m. What is the weight of the box? (What force did she exert?) (84.6 N) | 2. Bob White does 2,345 J of work pushing a car with a force of 186 N of force. What distance did he push the car? (12.6 m) |
| 3. Helena Handbasket brings a 5.2 kg box down from a 1.45 m tall shelf. What work does she do? (-74 J) |

Work and Weight:

|  |  |
| --- | --- |
| 4. Paul E. Wannacracker does 2375 J of work lifting what mass a height of 1.18 m? (205.4 kg) | 5. Tubi O’ Notubi does 137 J of work lifting a 5.25 kg mass to what height? (2.66 m) |

Work and Friction:

|  |  |
| --- | --- |
| 6. Hugh Jazz drags a 125 kg sled with a coefficient of kinetic friction of .15 a distance of 34 m. What work does he do? | 7. Seymour Butz does 1200 J of work dragging a 32 kg box with a coefficient of kinetic friction of .21 how far? |

**Noteguide for Power - Videos 5B Name**



A person does 48 J of work in 6.0 s. What is their power output?

My 30. HP van could go 25 m/s top speed. What was the force resisting its motion?

1 horsepower = 745.7 Watts, 1 kW = 1000 Watts

Whiteboards:

|  |  |
| --- | --- |
| 1. Joe Mama does 613 J of work in 2.13 seconds. What is his power output?(288 W) | 2. Ima Wonder can put out 127 W of power. What time will it take her to do 671 J of work? (5.28 s) |
| 3. What work does a 1.5 HP motor do in 1 minute? (P = 1.5x745.7 W)(67,113 J) | 4. Bob N. Frappels slides a box with 43 N of force at a constant speed of 5.3 m/s. What is his power output?(230 W) |
| 5. Frieda People can put out 430. W of power. With what speed can she push a car if it takes 152 N to make it move at a constant velocity?(2.83 m/s) |

**Noteguide for Work and Power JAMBALAYA - Videos 5C Name**





(do the whiteboards on the back)

Whiteboards:

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|  |

**Noteguide for Efficiency - Videos 5D Name**

 Example - 1 HP motor consumes 815 W of power



Whiteboards:

|  |  |
| --- | --- |
| 1. A motor consumes 425 J of energy and does 300 J of work. e = ? (0.71, or 71%) | 2. A person is 13% efficient. How much food energy to do 600. J of work? (4615 J) |
| 3. A 60.% efficient heater uses 800. J of energy. What is its heat output? (480 J) | 4. A car is 25% efficient. What energy input does it need to climb a 320 m tall hill if its mass is 1200 kg? (15,052,800 J) (Hint - Wo = (F)d = (mg)h ) |

**Noteguide for Energy - Videos 5E Name**

**Energy - the ability to do work.**

1.

2.

3.

4.

(Come up with a type of energy that you feel is not nuclear, and I will try to show that it is in class...)

Your example:

**Electromagnetic** – Energy of photons. (Einstein, big bang)

**Potential** - Energy of position. Stored energy.

Examples: Gravitational, chemical, springs

**Kinetic** - Energy of motion.

Examples: Baseballs, hammers

**Thermal** - Random potential and kinetic energy of molecules and atoms.

Examples: Hot stuff



**Noteguide for Gravitational Potential Energy - Videos 5F Name**



Example: What is the Potential Energy of a 5.0 kg mass 2.1 m from the ground?

Whiteboards:

|  |  |
| --- | --- |
| 1. What is the potential energy of a 4.5 kg bowling ball, 13.5 cm above the ground? (5.953 J) | 2. Toby Continued lifts a 75.0 kg box doing 1573 J of work. What is the change in height of the box?(2.14 m) |
| 3. Colin Host lifts himself up 15 m doing 9555 J of work. What is his mass? (65 kg) |

**Noteguide for Kinetic Energy - Videos 5G Name**



Example: What is the kinetic energy of a 4.20 g bullet going 965 m/s? (units?)

Whiteboards:

|  |  |
| --- | --- |
| 1. Ex1 - What speed must a .563 kg hammer move to store 34 J of energy? (11 m/s) | 2. Ex2 - A European swallow has 2.055 J of kinetic energy when it is flying at 14.23 m/s. What is its mass in grams? (0.020297 kg, 20.3 g) |
| 3. Ex3 - A 4.0 kg shot is sped up from 6.0 m/s to 9.0 m/s. What is the change in kinetic energy?(90 J) - (calculate two KEs and subtract) |

**Noteguide for Conservation of Energy - Videos 5K Name**









