Name: _____ Date: _____

# WORK, POWER, & ENERGY
## Work and Power Review

**Part 1: Linear Work and Power.    Compare and Contrast.**
Linear or Mechanical Work happens when a parallel force displaces an object.
Power is defined as the rate at which work is performed.

**Linear work**

$$W = F \cdot d$$

**Power**

$$P = \frac{W}{t}$$

W = work (J)
F = parallel force (N)
P = power (Watts)
t = time (s)
d = distance (m)

1.  Identify which person performed more work and used more power?
    Simon pulled the 40 kg wagon with a
    force of 50 N for a distance of 80 m in 1
    minute.                                           More work: _____
    Tandy pulled the 40 kg wagon with a
    force of 50 N for a distance of 80 m in 2
    minutes.                                          More power: _____


2.  Identify which person performed more work and used more power?
    Simon pulled the 40 kg wagon with a
    force of 50 N for a distance of 80 m in 1
    minute.                                           More work: _____
    Tandy pulled the 20 kg wagon with a
    force of 50 N for a distance of 80 m in 1
    minutes.                                          More power: _____


3.  Identify which person performed more work and used more power?
    Simon pulled the 40 kg wagon with a
    force of 25 N for a distance of 80 m in 1
    minute.                                           More work: _____
    Tandy pulled the 40 kg wagon with a
    force of 50 N for a distance of 80 m in 1
    minute.                                           More power: _____

4. Identify which person performed more work and used more power?
Simon pulled the 40 kg wagon with a
force of 100 N for a distance of 40 m in 2
minutes.                                                    More work: _____

Tandy pulled the 40 kg wagon with a
force of 200 N for a distance of 40 m in 4
minutes.                                                    More power: _____


5. Identify which person performed more work and used more power?
Simon pulled the 80 kg wagon with a
force of 30 N for a distance of 200 m in 10
minutes.                                                    More work: _____

Tandy pulled the 40 kg wagon with a
force of 60 N for a distance of 300 m in 15
minutes.                                                    More power: _____


**Part 2:  Work Against Gravity and Power.**
Work against gravity happens when an object is moved upward away from a permanent
surface.   The object is raised, lifted, or moved up.  Power is defined as the rate at which
work is performed.

| **Work against gravity** | **Power** | W = work (J) |
|---|---|---|
| $W = m \cdot g \cdot h$ | $P = \dfrac{W}{t}$ | m = mass (kg) |

W = work (J)
m = mass (kg)
g = 9.81 m/s$^2$
P = power (Watts)
t = time (s)
h = height (m)


6. Identify on which day Ted did more work and used more power?
On Monday, Ted walked up 50 stairs in 2
minutes.                                                    More work: _____
On Tuesday, Ted walked up 100 stairs in 2
minutes.                                                    More power: _____

7.  Identify on which day Ted did more work and used more power?
On Monday, Ted walked up 100 stairs in 4
minutes.                                             More work: _____
On Tuesday, Ted walked up 100 stairs in 6
minutes.                                             More power: _____


8.  Identify on which day Ted did more work and used more power?
On Monday, Ted walked up 50 stairs in 2
minutes.                                             More work: _____
On Tuesday, Ted walked up 100 stairs in 4
minutes.                                             More power: _____


9.  Identify on which day Ted did more work and used more power?
On Monday, Ted walked up 160 stairs in 8
minutes.                                             More work: _____
On Tuesday, Ted walked up 120 stairs in 6
minutes.                                             More power: _____


10.  Identify on which day Ted did more work and used more power?
On Monday, Ted walked up 90 stairs in 3
minutes.                                             More work: _____
On Tuesday, Ted walked up 120 stairs in 6
minutes.                                             More power: _____

**Part 3: Work.** Identify which form of work is being performed by the activity. Write the letter of the correct answer on the line to the left of the statement or question.
A = work ("mechanical" or linear).
B = Work against gravity.
C = Work against resistance.
D = Work against shape

_____ Bend a steel rod

_____ Climbing stairs

_____ Push a box across the floor

_____ Stretch a rubber band.

_____ Swim opposite river current

_____ Lifting a book to a shelf

_____ Tie knot in rope

_____ Inflate a balloon

_____ Shatter a window with a rock

_____ Tear paper

_____ Stretch a spring

_____ Ride in an elevator

_____ Pull a wagon

_____ Walk up a hill
Stack blocks on top of each
_____ other

_____ Mold clay