

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

$$W = m \cdot g \cdot h$$

Power

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

W = work (J)

m = mass (kg)

g = 9.81 m/s²

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