Name:	

Date:

Work and Power Worksheet

Answer each question by calculating for the missing variable. Be sure to show all calculation work in the space provided. Please circle your final answer and be sure it has the proper label.

1. You must exert a force of 4.5 N on a book to slide it across a table. If you do 2.7 J of work in the process, how far have you moved the book?

$$W = FD$$
 $D = W/F$
 $F = 4.5N$ $= 2.7J$ $= 0.6 m$

2. A child pulls a sled up a snow-covered hill. The child does 405 J of work on the sled. If the child walks 15 m up the hill, how large of a force must the child exert?

$$W = 405J$$
 $W = FD$
 $D = 15m$ $F = 405J$ $= 27N$
 $F = 7$

3. How much work is done on a small car if a 3150 N force is exerted to move it 75.5 m to the side of the road?

$$F = 3150N$$
 $W = FD$
 $D = 75.5m$ $= 3150N \cdot 75.5m$
 $W = ?$ $= 237825 J$

4. A crate is being lifted into a truck. If it is moved with a 2470 N force and 3650 J of work is done, then how far is the crate being lifted?

$$F = 2470 \text{ N}'$$
 $W = F \cdot D$
 $W = 3650 \text{ J}$
 $D = \omega/F = \frac{3650 \text{ J}}{2470 \text{ N}} = 1.48 \text{ m}$

5. If 16,700 J of work is done to shoot the human cannonball down a 3.05 m barrel, then how much force is applied to the person to fire them out the cannon?

$$W = 16,700J$$
 $W = F \cdot D$ $16,700J = 5475N$ $E = WD = 3.05$

6. An elephant pushes with 2000 N on a load of trees. It then pushes these trees for 150 m. How much work did the elephant do?

$$W=F\cdot D$$
 $W=2000N\cdot 150m$
 $P=150m$ $W=300,000 J$

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7. An 190,000 W engine can accelerate from rest to a top speed in 9 s. How much work did the engine do? Remember W = Watts (not work)

$$190,000 \text{ W} = \frac{\omega}{95} = 190,000 \times 9 \text{ sec} = 1,710,000 \text{ J}$$

8. Another engine reaches its top speed from rest in 7.5 s. It is able to perform 250,000 J of wok in that time. How much power does this engine have in that time?
P = \omega/\frac{\psi}{\psi}

W=250,000 J

9. If a runner exerts 350 J of work to make 125 W of power, then how long did it take the runner to do the work?

power = 125W

125W(t) = 350 J

Subject	, Period	Teacher	·	Dat	e
•	Worksh	eet - Work	& Power Prob	lems	
I. Work	WOIRDI	OOL WOLK	& 1 0 W C1 1 100	701113	
A. Sample Problems:					
· •			. }		
1. $F = 200$ Newtons	Formula: _	W=F	d		
d = 50 meters	Substitution		200 N	(50 m)	
W = ?	Answer wit	h unit of m	easure: 10	,000 J	
2 E - 5 Novetono	771	W=Fd		W/F	
2. F = 5 Newtons W = 75 Joules				<u> </u>	
V = 73 foules $D = ?$	Substitution Answer wit		J = 5N	<u>. a </u>	
D :				5 m	
3. $W = 125$ Joules	Formula:	F= W	4		
d = 10 meters	Substitution		125-10	}	
F = ?		***************************************	easure: 12		
4. If 150 Joules of work			10 meters, wh	at force was used	1?
. 13	$\frac{DJ}{Dm} = 1$	5 N			
B. Fill-in-the-blank:	om '				
o. i m-m-tho-olaga.					•
1. Work	is done whe	n an object	moves through	h a distance becar	use of a
10100	cting upon the	object.		,	
10/00	ring upon the	object.		,	
2. When calculating wor	k, you should	object. use the forn		,	
2. When calculating wor	k, you should	use the forn	nula: work=	force X <u>distar</u>	or displa nce
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13. How much work is done in holding a 15 N sack of potatoes while waiting in line at the grocery store for 3 minutes.

Joules

- II. Power
- A. Sample Problems:
 - 1. W= 500 Joules

Formula:

t = 25 seconds Substitution: P - 500 -25 P = ?

Answer with unit of measure: 20 Watt

2. P = 25 watts W = 5000 Joules t = ?

Formula: t = Work/p

Substitution: \(\tau = 1000 \div 25

Answer with unit of measure: = 200 Sec

3. P = 170 watts t = 20 seconds W = ?

Formula: $W = P \cdot t$.

Substitution: $W = 170 \cdot 20$

Answer with unit of measure: 3400

- 4. If a man moves a large box that weighs 10 Newtons 20 meters in 30 seconds, how much power was used?
- B. Fill-in-the-blank:
 - 1. Power

is the rate at which work is done.

- 2. When calculating power, you should use the formula $P = W \partial Y K$ time. In this formula, "P" stands for power, W stands for work, and t for time.
- 3. The SI unit for Power is the Watt
- C. Power Problems

4.
$$W = 100 J$$
 $t = 10 s$ $P = ?$ $100 \div 10$

6.
$$P = 20 W$$

 $t = 15 s$

P = 64 W

W = ?

7.
$$W = 500 J$$

 $t = 25 s$
 $P = ?$

8.
$$W = 336 J$$
 T

P = 14 W

W=P.t

10. A person weighing 600 N gets on an elevator. The elevator lifts the person 6 m in 10 seconds. How much power was used? W=F.d

F=600N t=100ec

10 sec

D=6m 11. How much time is needed to produce 720 Joules of work if 90 watts of power is used?

7205/90W = (8 Acc

12. If 68 W of power is produced in 18 seconds, how much work is done?

= 48W.185 = MZZ4 J . P=68W P=W/T W=P.t

13. A set of pulleys lifts an 800 N crate 4 meters in 7 seconds. What power was used? W=F.d=800N.4m= 32005