

## Units

Joules  
 $\text{kg} \cdot \text{m}^2/\text{s}^2$   
 $\text{N} \cdot \text{m}$

$$W = Fd$$

## Work 3.2 worksheet Answers

- ① Applying a force over a distance.
- ② Work = Force x distance. Direct relationship
- ③ Joule  
 $\text{kg} \cdot \text{m}^2/\text{s}^2$   
 $\text{N} \cdot \text{m}$
- ④ a - No  
b - Yes  
c - No  
d - Yes  
e - Yes
- ⑤  $100 \text{ N} (1 \text{ m}) = 100 \text{ N} \cdot \text{m}$
- ⑥  $90 \text{ N} (1 \text{ m}) = 90 \text{ N} \cdot \text{m} \times 2 = 180 \text{ N} \cdot \text{m}$
- ⑦  $= 200 \text{ N} (500 \text{ m})$   
 $= 100,000 \text{ N} \cdot \text{m}$
- ⑧  $= 100 \text{ N} (0.5 \text{ m})$  No work carrying the sled  
 $= 50 \text{ N} \cdot \text{m}$
- ⑨ No work since its being carried
- ⑩  $10,000 \text{ N} \cdot \text{m} = 10,000 \text{ J}$  (same unit)
- ⑪ A -  $\frac{150 \text{ N} \cdot \text{m}}{120 \text{ N}} = \frac{120 \text{ N} (d)}{120 \text{ N}}$   
 $1.25 \text{ m} = d$   
B -  $120 \text{ N} \left( \frac{116}{4.448 \text{ N}} \right) = 26.98 \text{ lbs}$
- ⑫  $\frac{62,500 \text{ N} \cdot \text{m}}{25 \text{ m}} = F \left( \frac{25 \text{ m}}{25 \text{ m}} \right)$   
 $2500 \text{ N} = F$
- ⑬  $\frac{30,000 \text{ N} \cdot \text{m}}{20 \text{ m}} = \frac{20 \text{ m} (F)}{20 \text{ m}}$   
 $1500 \text{ N} = F$
- ⑭  $45 \text{ N} (1.2 \text{ m}) = 54 \text{ N} \cdot \text{m}$

$$\textcircled{15} = 450 \text{ N}(0.5 \text{ m})$$

$$= 225 \text{ Nm}$$

$$\textcircled{16} \frac{250 \text{ Nm}}{500 \text{ N}} = \frac{500 \text{ N}(d)}{500 \text{ N}}$$

$$0.5 \text{ m} = d$$

$\textcircled{17}$  A - None

$$B = 100 \text{ N}(1 \text{ m})$$

$$= 100 \text{ Nm} = 100 \text{ J of work}$$

$\textcircled{18}$  A - No work

$$B = 22 \text{ N}(0.5 \text{ m}) = 11 \text{ Nm}$$

$$C = 40 \text{ N}(1 \text{ m}) = 40 \text{ Nm} \times 10 \text{ bags} = 400 \text{ Nm of work}$$

Henry did the most work