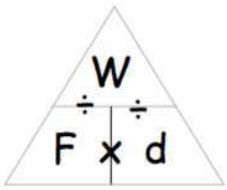
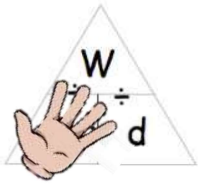
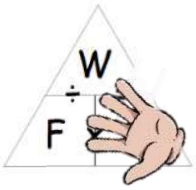
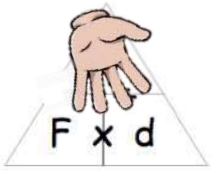
Work done calculations: MS

Work done (J) = Force (N) x Distance (m)









Worked example: What is the work done if:

(a) Force = 3N, distance = 6m

STEP 1: Write the equation:

Work done (J) = Force (N) × Distance (m)

STEP 2: Calculate:

= 3N × 6m

Work done (J) = 18J

(b) Force = 20N, distance = 5m

STEP 1: Write the equation:

Work done (J) = Force (N) × Distance (m)

STEP 2: Calculate:

= 20N × 5m

Work done (J) = 100J

1. What is the work done if:

(a) Force = 10N, distance = 10m

STEP 1: Write the equation:

Work done (J) = Force (N) × Distance (m)

STEP 2: Calculate:

= 10N × 10m

Work done (J) = 100J

(b) Force = 50N, distance = 5m

STEP 1: Write the equation:

Work done (J) = Force (N) × Distance (m)

STEP 2: Calculate:

= 50N × 5m

Work done (J) = 250J

(c) Force = 750N, distance = 46m

STEP 1: Write the equation:

Work done (J) = Force (N) × Distance (m)

STEP 2: Calculate:

= 750N × 46m

Work done (J) = 34,500J

(d) Force = 267N, distance = 49m

STEP 1: Write the equation:

Work done (J) = Force (N) × Distance (m)

STEP 2: Calculate:

= 267N × 49m

Work done (J) = 13,083J

2. What is the force if:

(a) Work done = 1000J, distance = 2m

STEP 1: Write the equation:

Force (N) = Work done (J) ÷ Distance (m)

STEP 2: Calculate:

= 1000J ÷ 2m

Force (N) = 500N

(b) Work done = 70J, distance = 5m

STEP 1: Write the equation:

Force (N) = Work done (J) ÷ Distance (m)

STEP 2: Calculate:

= 70J ÷ 5m

Force (N) = 14N

(c) Work done = 3600J, distance = 40m

STEP 1: Write the equation:

Force (N) = Work done (J) ÷ Distance (m)

STEP 2: Calculate:

= 3600J ÷ 40m

Force (N) = 90N

(d) Work done = 4539J, distance = 51m

STEP 1: Write the equation:

Force (N) = Work done (J) ÷ Distance (m)

STEP 2: Calculate:

= 4539J ÷ 51m

Force (N) = 89N

3. What is the distance if:

(a) Force = 100N, Work done = 2300J

STEP 1: Write the equation:

Distance (m)	=	Work done (J)	÷	Force (N)

STEP 2: Calculate:

	=	2300J	÷	100N
Distance (m)	=	23m		

(b) Force = 20N, Work done = 4680J

STEP 1: Write the equation:

Distance (m)	=	Work done (J)	÷	Force (N)

STEP 2: Calculate:

	=	4680J	÷	20N
Distance (m)	=	234m		

(c) Force = 10N, Work done = 5800J

STEP 1: Write the equation:

Distance (m)	=	Work done (J)	÷	Force (N)

STEP 2: Calculate:

	=	5800J	÷	10N
Distance (m)	=	580m		

(d) Force = 79N, Work done = 5056J

STEP 1: Write the equation:

Distance (m)	=	Work done (J)	÷	Force (N)

STEP 2: Calculate:

	=	5056J	÷	79N
Distance (m)	=	64m		

Stretch and challenge: Calculate:

Work done if:

(a) Force = 10N, distance = 10cm

STEP 1: Write the equation:

Work done (J)	=	Force (N)	×	Distance (m)

STEP 2: Conversions:

cm to m	10cm	= 0.1m

STEP 2: Calculate:

	=	10N	×	0.1m
Work done (J)	=	1J		

(b) Force = 25N, distance = 11mm

STEP 1: Write the equation:

Work done (J)	=	Force (N)	×	Distance (m)

STEP 2: Conversions:

mm to m	11mm	= 0.011m

STEP 2: Calculate:

	=	25N	×	0.011m
Work done (J)	=	0.275J		

Force if:

(c) Work done = 10KJ, distance = 2m

STEP 1: Write the equation:

Force (N)	=	Work done (J)	÷	Distance (m)

STEP 2: Conversions:

KJ to J	10KJ	= 10,000J

STEP 2: Calculate:

	=	10,000J	÷	2m
Force (N)	=	5,000N		

(d) Work done = 15KJ, distance = 36cm

STEP 1: Write the equation:

Force (N)	=	Work done (J)	÷	Distance (m)

STEP 2: Conversions:

KJ to J	15KJ	= 15,000J
cm to m	36cm	= 0.36m

STEP 2: Calculate:

	=	15,000J	÷	0.36m
Force (N)	=	41,666.7N		

Distance if:

(e) Force = 100mN, Work = 23J

STEP 1: Write the equation:

Distance (m)	=	Work done (J)	÷	Force (N)

STEP 2: Conversions:

mN to N	100mN	= 0.1N

STEP 2: Calculate:

	=	23,000J	÷	0.1N
Distance (m)	=	230,000m		

(f) Force = 23N, Work = 23KJ

STEP 1: Write the equation:

Distance (m)	=	Work done (J)	÷	Force (N)

STEP 2: Conversions:

KJ to J	23KJ	= 23,000J

STEP 2: Calculate:

	=	23,000J	÷	23N
Distance (m)	=	10,000m		

HINT: Remember the units , do any of these units need converting?