2. The Language of Motion

Motion involves a change in location. There are different ways of measuring motion. These can be placed in two categories:

1. Scalar quantity: A scalar quantity or scalar describes the **size or amount** of a measurement
= magnitude
Example: **You walk 4 km/h.**

2. Vector quantity: A vector quantity or vector has both magnitude and **direction**.
Example: **You walk 4 km/h [E].**

Read Pages 296-297 and complete the following chart:

Quantity & Symbol	Vector or Scalar	Description of the term	Answers this question	Example of usage
Time				
Time interval				
Distance d	S	= total length of a journey = how far an object has travelled	How far has it traveled	It was a 5 km walk to grandma's.
Position $\vec{d}$	V	= location of an object	Where is it located	Grandma's house is 7 blocks east of mine.
Displacement $\Delta\vec{d}$	V	= change of an object's position = how far from the starting position	How far is it from start	When I am at Grandmas, I am 3 km E of my house
Speed v	S	= how fast an object is travelling	How fast	I walked at 5km/h to grandma's.
Velocity $\vec{v}$	V	= how fast an objects position is changing	How fast	I walked at 5km/h East to grandma's.
Acceleration $\vec{a}$	V	= how much an objects velocity/speed changes	At what rate	I accelerated at 0.25km/h/s to keep up with my dog.

Science 10: Physics
Scalar and Vector Quantities Worksheet
Answers

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1. Determine if each quantity is scalar or vector.

(a) 5.0m/s **scalar**

(b) 110km/h [West] **vector**

(c) 6 hours **scalar**

(d) 15km [N] **vector**

(e) 32°C **scalar**

(f) 90m **scalar**

(g) 60km/h **scalar**

(h) 13cm [to the right] **vector**

(i) 60km/h [E] **vector**

2. Complete each vector addition.

(a) $\vec{A} = 8\text{km}\mathbf{[E]}$ and $\vec{B} = 13\text{km[E]}$ **21km [E]**

(b) $\vec{H} = +16\text{m}$ and $\vec{K} = -10\text{m}$ **+6m**

(c) $\vec{T} = 6\mathbf{m[E]}$ and $\vec{U} = 12\text{m[W]}$ **6m [W]**

(d) $\vec{A} = 125\mathbf{m[S]}$ and $\vec{B} = 84\text{m[S]}$ **209m [S]**

(e) $\vec{X} = 6\mathbf{m[East]}$ and $\vec{Y} = 10\text{m[West]}$ and $\vec{Z} = 14\text{m [East]}$ **10m [East]**

(f) $\vec{E} = +25\text{km}$ and $\vec{F} = -25\text{km}$ **0km**

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= magnitude
Example: _____

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(f) $\vec{E}$= +25km and $\vec{F}$= –25km