

Name:

Date:

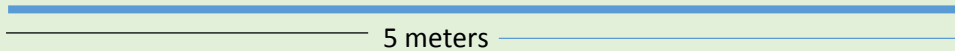
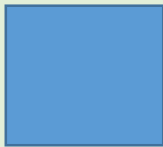
Class:

Scalars and Vectors

To understand motion, we must understand Vectors and Scalars. In physics, we use words to describe the motion of objects. When we use these words like speed, displacement, direction, and so on we sometimes discuss quantities or numbers that go along with those words. We may say things like 5 meters per second or 10 miles per hour north. The numbers or quantities that we use in physics are put into two groups – Scalars and vectors.

Vectors	Scalars
Have a magnitude (size) and direction.	ONLY have a magnitude (size).
5 meters per second north .	5 meters per second.

Scalar



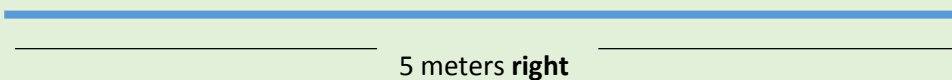
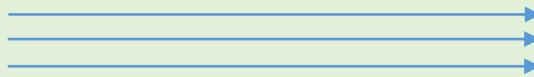
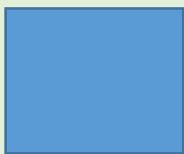
The block moved 5 meters.

The magnitude (or size) of the movement with no direction given is called a what?

A Scalar!

This is an example of a scalar. The magnitude of the block was 5 meters.

Vector



The block moved 5 meters **right**

The magnitude of the movement with a direction given is called a what?

A Vector!

This is an example of a vector. The magnitude of the block was 5 meters and the direction was **right**.

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Scalar or Vector Quantity?

Directions: Tell whether the statement below describes a vector quantity or a scalar quantity. Circle the correct answer.

1.) **5 meters**

Scalar Vector

2.) **10 Kilometers North**

Scalar Vector

3.) **80 Kilometers per hour**

Scalar Vector

4.) **5 Meters right**

Scalar Vector

5.) **26 centimeters**

Scalar Vector

6.) **1000 hectometers**

Scalar Vector

7.) **9 kilometers left**

Scalar Vector

8.) **38 kilometers right**

Scalar Vector

9.) **42 meters**

Scalar Vector

10.) **53 mm**

Scalar Vector

11.) **100 degrees Celsius**

Scalar Vector

12.) **70 mph, south**

Scalar Vector

13.) **40 hertz**

Scalar Vector

14.) **Most water bottles are labeled 500ml, meaning they contain 500 milliliters or .5 liters of fluid. Interestingly, 1ml of water at 4 degrees Celsius is equal to 1 gram. We can express this quantity as 1g/ml or 1 gram per milliliter. Is this quantity a...**

• Scalar or Vector

15.) **In the USA, Myanmar (formerly Burma), and Liberia, the United States customary units (sometimes called Imperial units) are used for measuring. Some examples include 12 oz. or 12 ounces, a popular measurement for soda and 26 miles, which is roughly the distance of a running marathon. Some people who run marathons choose to run a half marathon, or roughly 13.1 miles south. Is this quantity a...**

• Scalar or Vector

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KEY - Scalar or Vector Quantity?

Directions: Answers are in red.

16.) 5 meters

Scalar Vector

17.) 10 Kilometers North

Scalar Vector

18.) 80 Kilometers per hour

Scalar Vector

19.) 5 Meters right

Scalar Vector

20.) 26 centimeters

Scalar Vector

21.) 1000 hectometers

Scalar Vector

22.) 9 kilometers left

Scalar Vector

23.) 38 kilometers right

Scalar Vector

24.) 42 meters

Scalar Vector

25.) 53 mm

Scalar Vector

26.) 100 degrees Celsius

Scalar Vector

27.) 70 mph, south

Scalar Vector

28.) 40 hertz

Scalar Vector

29.) Most water bottles are labeled

500ml, meaning they contain 500 milliliters or .5 liters of fluid.

Interestingly, 1ml of water at 4 degrees Celsius is equal to 1 gram. We can express this quantity as *1g/ml* or *1 gram per milliliter*. Is this quantity a...

• Scalar or Vector

30.) In the USA, Myanmar (formerly

Burma), and Liberia, the United

States customary units (sometimes called Imperial units) are used for measuring. Some examples include

12 oz. or 12 ounces, a popular

measurement for soda and 26 miles,

which is roughly the distance of a

running marathon. Some people who

run marathons choose to run a half

marathon, or roughly *13.1 miles*

south. Is this quantity a...

• Scalar or Vector