



G6
Basic

G7
Advanced

Helping With Math

GRADES

Measuring Skill
Measuring Speed

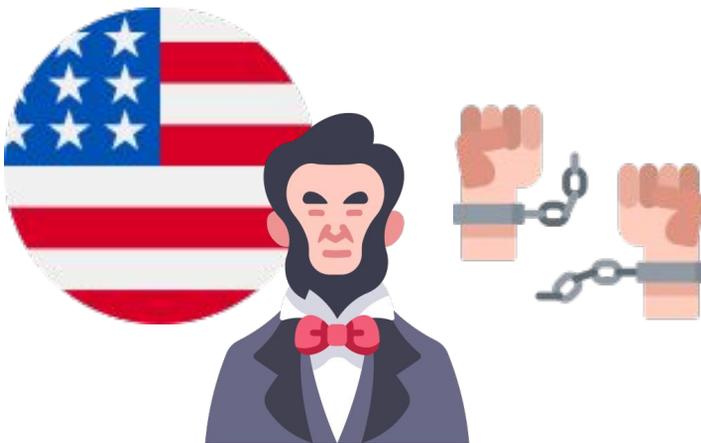
Suitable for students
aged 10-12



This pack is suitable for learners aged 10-12 years old or 6th to 7th grades.

The content covers fact files and relevant basic and advanced activities of measuring speed topics that aim to develop and strengthen the learners' measuring skills.

The Emancipation Proclamation



On January 1, 1863, the 16th US President Abraham Lincoln issued the Emancipation Proclamation. It declared that “all persons held as slaves” within the rebellious states “are henceforward shall be free.”

The Emancipation Proclamation Highlights

- The proclamation aims to emancipate all enslaved people presently immersed in rebellion against the federal “shall be then, forever free.”
- In 1863 during the third year of the American Civil War, the declaration did not totally free nearly four million men, women, and children held in slavery in the US but only those in Southern states that seceded from the Union. They called themselves the Confederate States of America.



MEASUREMENT

Measurement describes and compares concrete and mathematical objects by associating numbers and units of measurement. In other words, it shows the size or amount of something.

Measurement helps us identify how large or small a physical quantity is compared to the unit of measure in mathematics.

What are some properties of measurement?

- Length
- Mass
- Weight
- Time
- Money
- Temperature
- Perimeter
- Area
- Surface Area
- Volume

LEARNING MEASUREMENT...

- It strengthens your understanding of numbers.
- It helps you compare, approximate, and count accurately.
- It helps you sort objects by size, how big or small it is.
- It allows you to know the exact size of a thing.



- There are five primary disciplines of mathematics, namely: number sense, algebra, geometry, data analysis and probability, and measurement.
- These aforementioned disciplines must be transferred effectively to the students through a holistic approach in teaching.



MEASURING SKILL

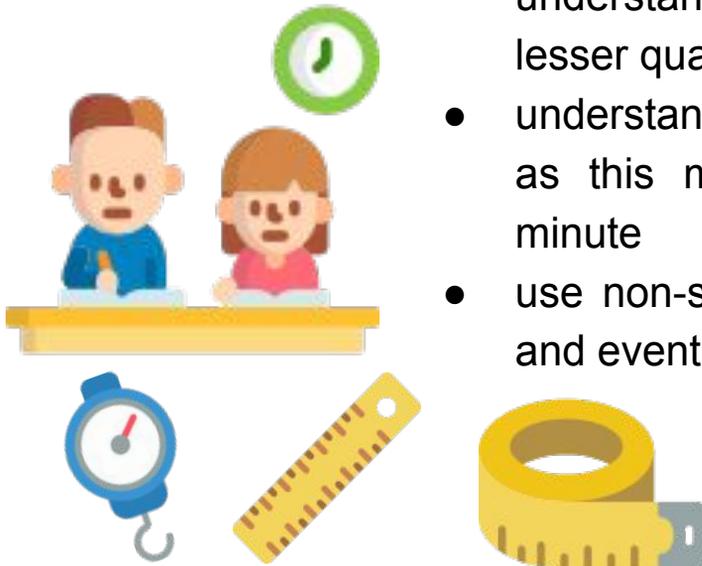
As mentioned, measurement is one of the vital disciplines. Thus, measuring skills play an important role in the development of a child's learning.

Measuring skills...

- cover the skills needed for a learner to effectively do the measuring.
- are the processes of how to measure physical attributes of objects appropriately and accurately using measurement tools and techniques.

During their early education, children developed these measuring skills. They learn to...

- compare objects by size (big, bigger, biggest)
- compare objects by length, height, and weight
- compare groups of objects and understand that a lesser number is also a lesser quantity
- understand basic concepts of time, such as this morning or yesterday, or in a minute
- use non-standard forms of measurement and eventually the standard forms.



MEASURING SPEED

What is Speed?

- Speed is a measure of how fast a body is moving.
- Speed is the rate at which an object covers some distance.
- Speed is calculated as the ratio of an object's covered distance over time (in seconds, minutes, hours, etc).
- The SI unit of speed is meter per second or m/s.
- Aside from m/s, units for speed can be expressed as km/hr (kph), miles/hr, etc.



Speed Formula



$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$



Why Do We Need to Learn Measuring Speed?

If we know how to determine the speed of an object, we can estimate/predict the time it takes to travel at a certain speed and distance.



SAMPLE/APPLICATION

Illustrative Examples:



1. In 1863, when the Emancipation Proclamation happened, soldiers could expect to cover at least fifteen miles per day. How long would the distance be if they walk in constant speed for 5 days?

Given:

Speed of the soldiers walking = **15 miles per day**

Solve for the distance covered in 5 days.

$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$\text{Distance} = (15 \text{ miles per day}) \times (5 \text{ days}) = \text{75 miles}$$

Thus, the soldiers will cover 75 miles in 5 days.

2. In relation to item number 1, if the soldiers increase their pace and can now cover 150 miles in 5 days, what would be their new calculated speed?

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} \qquad \text{Speed} = \frac{150 \text{ miles}}{5 \text{ days}}$$

Answer:

Speed = 30 miles per day



TABLE OF ACTIVITIES

Ages 10-11 (Basic)		G6
1	The Emancipation	
2	The Walking Soldiers	
3	The Confederate States of America	
4	The Union	
5	War Wagons	
Ages 11-12 (Advanced)		G7
6	President Lincoln's Task	
7	Freedom for Slaves	
8	The First Steamboats	
9	The President's Order: Convert	
10	Civil War Vehicles	

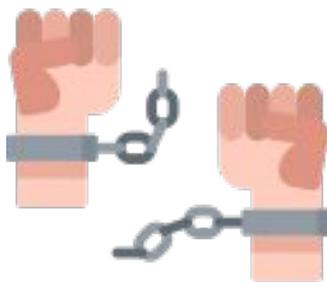


THE EMANCIPATION

G6
Basic

To emancipate means to set free from legal, social, or political restrictions. If the only way to emancipate the people under slavery during the American Civil War will be by getting all the correct answers to the questions below, will they be freed?

Distance (m)	Time (s)	Speed (m/s) (round off to the nearest tenths)
100	60	
25	4	
48	12	
560	80	
1000	180	
128.25	50	
11	5.5	
472	64.75	



THE WALKING SOLDIERS

G6
Basic

During the mid-19th century, automobiles were yet to be born. Thus, soldiers have to walk in order to travel from one place to another. Given the speed and distance of their travel, compute for the time.

5) speed = 20 kph
distance = 2 km



4) speed = 6.67 m/s
distance = 20 km



3) speed = 33 m/s
distance = 120 km



2) speed = 2 m/s
distance = 3600 m



1) speed = 35 m/s
distance = 60 m



THE UNION

G6
Basic

Let's integrate the states who were referred to as the Union or the North during the American Civil War and the understanding of measuring speed.

Even before the Emancipation Declaration in 1863, these states are loyal to the federal government. They are called the Union or the North.



1. Minnesota and Michigan are members of the Union during the American Civil War. Suppose that you want to go to Michigan from Minnesota with a distance of 696.3 mi. What must be your car speed (in kph) if you want to have an 11-hour drive?

2. In relation to the previous item, if you leave Minnesota at 5:00 a.m., what time will you arrive in Michigan given that your car speed is 55.46 mph?



WAR WAGONS

G6
Basic

Years before the issuance of Emancipation Proclamation, the main mode of transportation was wagons. Solve the following word problems using your knowledge about speed.

1. The length of the wagon trail from the Missouri River to Sacramento, California was about 1,950 miles. If a wagon's rate being pulled by oxen is between 10 to 20 miles per day, what is the travel time of the wagon from Missouri River to Sacramento, California?



2. During the American Civil War (1861-1865), ambulance wagons pulled by horses were used to transport sick or wounded soldiers off the battlefield. If the distance needed to cover is 80 mi. What must be the speed of the ambulance wagons to reach the medical camp in $4\frac{1}{2}$ days?



PRESIDENT LINCOLN'S TASK

G7
Advanced

Abraham Lincoln was the 16th serving president of the United States of America. He was the one who issued the Emancipation Proclamation in 1863. Help him convert the following mph measures to m/s unit.

Note: The speed in meters per second is equal to the miles per hour multiplied by 0.44704.

1) 45 mph

2) 60 mph

3) 100 mph

4) 115 mph

5) 232 mph

6) 14.50 mph

7) 89.7 mph

8) 56.25 mph

9) 19.75 mph

10) 21.62 mph



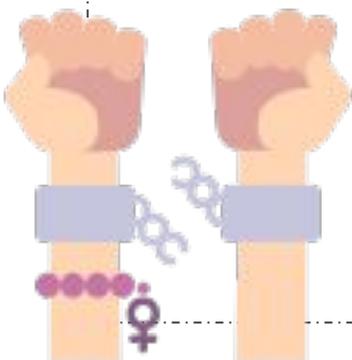
FREEDOM FOR SLAVES

G7
Advanced

Free the men, women, and children who are held under slavery by completing the table of values below. Use the equation as your guide.

To convert m/s to mph, use the equation $y = 2.2369x$, where y is the measure of speed in mph and x is the measure of speed in m/s.

x	y
11.25	
14.35	
16.29	
40.2	
90	

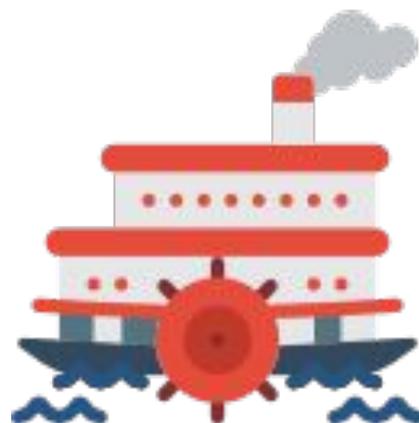


THE FIRST STEAMBOATS

G7
Advanced

During the 19th century, steamboats were used for river travel and trade. They were the kings of the waterways in the US with rivers such as Mississippi, Alabama, etc. Answer the following steamboat-related problems involving speed.

- 1) After the Emancipation Declaration in 1863, the members of the Union Army traveled using a steamboat. They covered a distance of 38 miles in $2\frac{1}{2}$ days. What was the speed of the boat?



- 2) The military officials of the Confederate States of America needed to go to another state via steamboat as soon as possible. There were two steamboats available: steamboat A can cover 15 miles in $1\frac{1}{2}$ days while steamboat B can travel 20 miles in $2\frac{1}{3}$ days. Which steamboat would be a better choice? Why?



THE PRESIDENT'S ORDER: CONVERT

G7
Advanced

President Lincoln ordered you to convert the following measures to its desired units. You may use the conversion table below.

Conversion Table

1 m/s = 3.6 kph 1 knot = 1.15078 mph 1 mph = 0.868976 knots

- 1) 15 m/s = _____ kph
- 2) 90 m/s = _____ kph
- 3) 100 kph = _____ m/s
- 4) 5.5 knots = _____ mph
- 5) 12.5 knots = _____ mph
- 6) 14 mph = _____ knots
- 7) 100 mph = _____ knots
- 8) 56.15 knots = _____ mph
- 9) 200 m/s = _____ kph
- 10) 2 mph = _____ knots

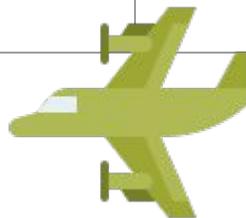


CIVIL WAR VEHICLES

G7
Advanced

Emancipation Proclamation was declared during the third year of the American Civil War. What were the vehicles that they used during that time? Make a comparison of the war vehicles before and at present in terms of their speed. Use the table below for your answers.

Civil War Vehicle	Speed (mph)	Modern War Vehicle	Speed (mph)



ANSWER GUIDE

Activity 1

- | | | | |
|------------|------------|----------|------------|
| 1) 1.7 m/s | 2) 6.3 m/s | 3) 4 m/s | 4) 7 m/s |
| 5) 5.5 m/s | 6) 2.6 m/s | 7) 2 m/s | 8) 7.3 m/s |

Activity 2

- | | | |
|-------------|-----------|--------------|
| 1) 1.7 s | 2) 1800 s | 3) 3.636.3 s |
| 4) 2998.5 s | 5) 10 h | |

Activity 3

- 1) Texas to Arkansas - 6.9 hrs
- 2) Arkansas to Alabama - 5.2 hrs
- 3) Alabama to Florida - 6.4 hrs
- 4) Florida to South Carolina - 5.86 hrs
- 5) South Carolina to Virginia - 4 hrs

Activity 4

- | | |
|--------------|------------|
| 1) 101.9 kph | 2) 5:36 pm |
|--------------|------------|

Activity 5

- 1) 195 days or about 6 $\frac{1}{2}$ months to 97.5 days or 3 $\frac{1}{4}$ months
- 2) 17.8 miles per day

Activity 6

- | | | | |
|------------|------------|-----------|------------|
| 1) 20.1168 | 2) 26.8224 | 3) 44.704 | 4) 51.4096 |
| 5) 103.713 | 6) 6.48 | 7) 40.1 | 8) 25.146 |
| 9) 8.8 | 10) 9.7 | | |



ANSWER GUIDE

Activity 7

x	y
11.25	25.17
14.35	32.1
16.29	36.44
40.2	89.9
90	201.32

Activity 8

- 1) 15.2 miles per day
 - 2) steamboat A speed: 10 miles per day
steamboat B speed: 8.6 miles per day.
- The better choice is steamboat A because it has a higher speed than steamboat B.

Activity 9

- | | | | |
|---------|----------|----------|---------|
| 1) 54 | 2) 324 | 3) 27.78 | 4) 8.3 |
| 5) 18.8 | 6) 12.2 | 7) 87 | 8) 84.7 |
| 9) 720 | 10) 1.74 | | |

Activity 10

Answers may vary.



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