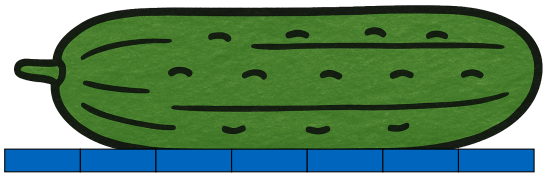
LENGTH

A DEFINITION

A.1 MEASURING LENGTHS WITH BLOCKS

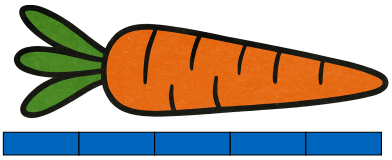
Ex 1: How long?



7 blocks long

Answer: The cucumber measures 7 blocks long.

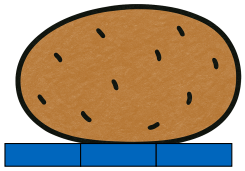
Ex 2: How long?



5 blocks long

Answer: The carrot measures 5 blocks long.

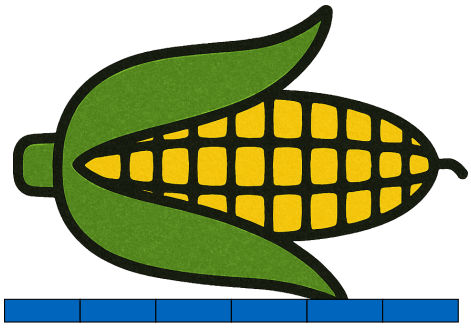
Ex 3: How long?



3 blocks long

Answer: The potato measures 3 blocks long.

Ex 4: How long?

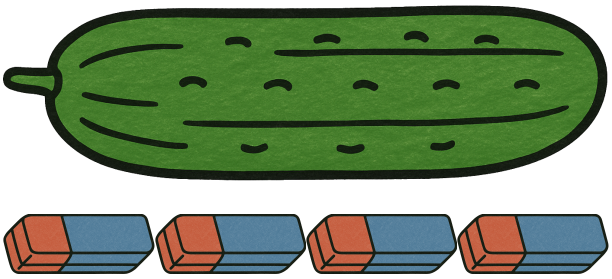


6 blocks long

Answer: The corn measures 6 blocks long.

A.2 MEASURING LENGTHS WITH ERASERS

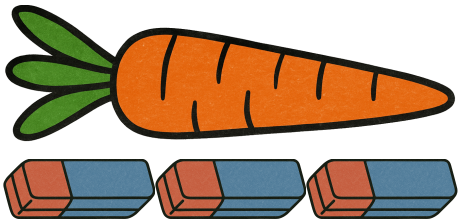
Ex 5: How long?



4 erasers long

Answer: The cucumber measures 4 erasers long.

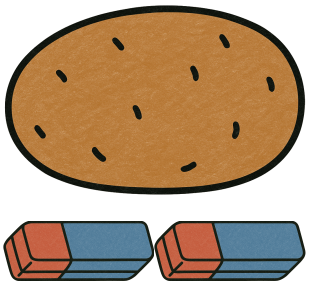
Ex 6: How long?



3 erasers long

Answer: The carrot measures 3 erasers long.

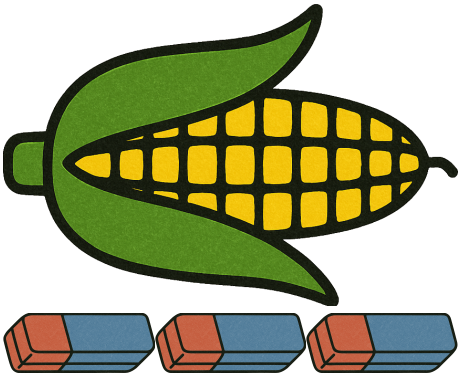
Ex 7: How long?



2 erasers long

Answer: The potato measures 2 erasers long.

Ex 8: How long?



3 erasers long

Answer: The corn measures 3 erasers long.

B LENGTH UNITS

B.1 CHOOSING LENGTH UNITS

MCQ 9: Which unit will be used to measure how long a pencil is?

Choose 1 answer:

- ☐ Millimeters
- ☐ Centimeters
- ☒ Meters

☐ Kilometers

Answer: Centimeters will be used to measure how long a pencil is.

MCQ 10: Which unit will be used to measure the distance between two cities?

Choose 1 answer:

☐ Millimeters

☐ Centimeters

☐ Meters

☒ Kilometers

Answer: Kilometers will be used to measure the distance between two cities.

MCQ 11: Which unit will be used to measure how tall a tree is?

Choose 1 answer:

☐ Millimeters

☐ Centimeters

☒ Meters

☐ Kilometers

Answer: Meters will be used to measure how tall a tree is.

MCQ 12: Which unit will be used to measure the length of an ant?

Choose 1 answer:

☒ Millimeters

☐ Centimeters

☐ Meters

☐ Kilometers

Answer: Millimeters will be used to measure the length of an ant.

MCQ 13: Which unit will be used to measure how long a book is?

Choose 1 answer:

☐ Millimeters

☐ Centimeters

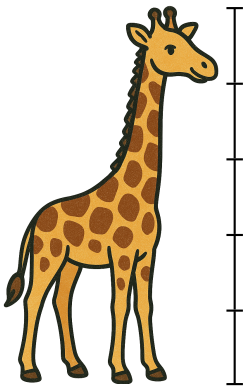
☒ Meters

☐ Kilometers

Answer: Centimeters will be used to measure how long a book is.

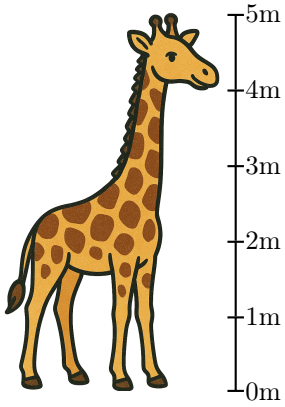
B.2 MEASURING

Ex 14:

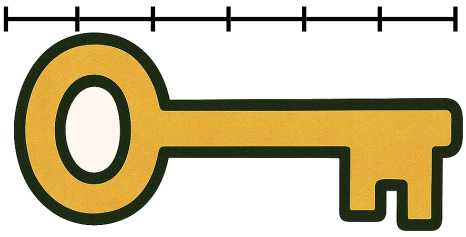


The giraffe measures 5 **meters** tall.

Answer: The giraffe measures 5 meters tall.

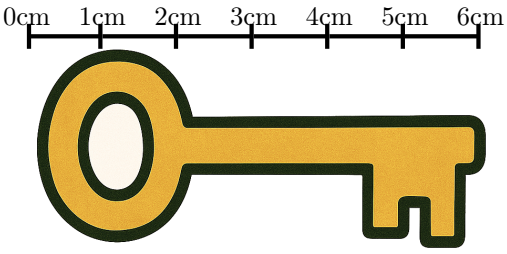


Ex 15:

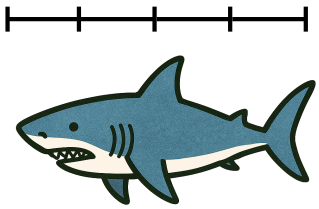


The key measures 6 **centimeters** long.

Answer: The key measures 6 centimeters long.

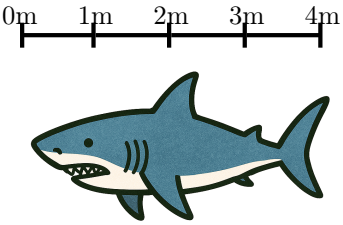


Ex 16:

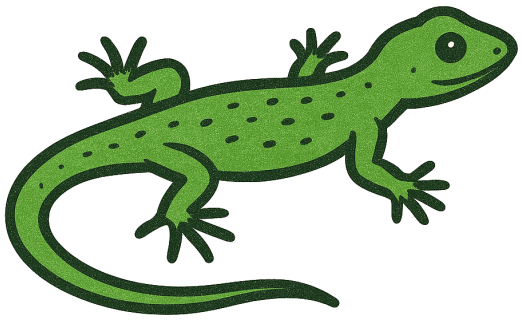


The shark measures 4 **meters** long.

Answer: The shark measures 4 meters long.

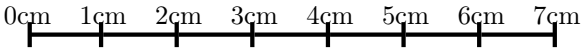


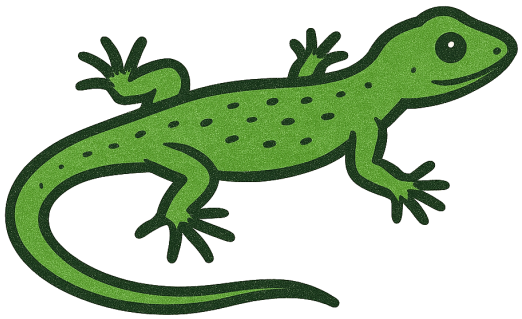
Ex 17:



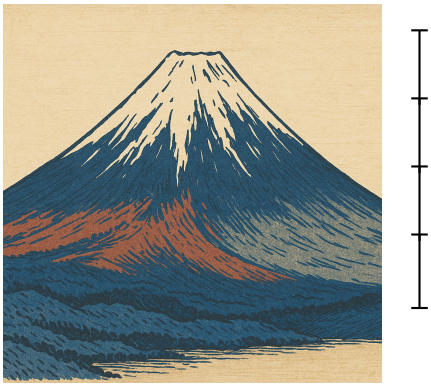
The lizard measures 7 **centimeters** long.

Answer: The lizard measures 7 centimeters long.





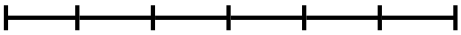
Ex 18:

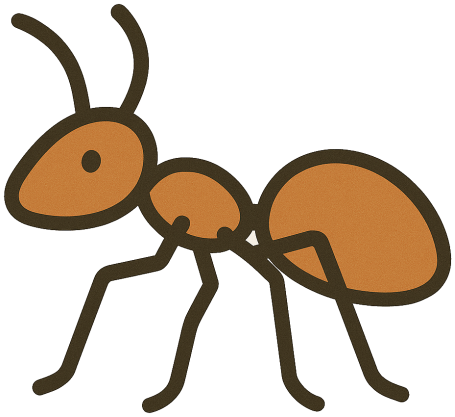


Mount Fuji measures 4 **kilometers** tall.

Answer: Mount Fuji measures 4 kilometers tall.

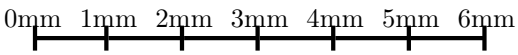
Ex 19:

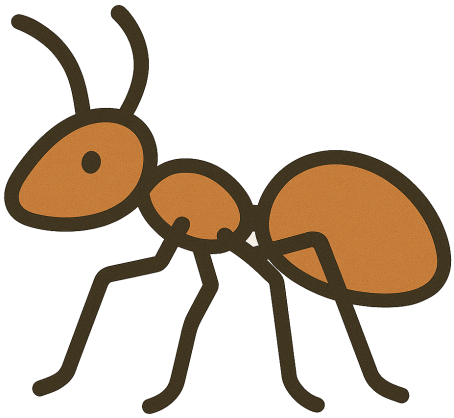




The ant measures 6 **millimeters** long.

Answer: The ant measures 6 millimeters long.





C CONVERSION OF LENGTH UNITS

C.1 CONVERTING UNITS OF LENGTH

Ex 20: Convert:

$$2\,\text{km} = \boxed{2000}\ \text{m}.$$

Answer:

- *Multiplication Method:*

$$\begin{aligned} 2\,\text{km} &= 2 \times 1\,000\,\text{m} \\ &= 2\,000\,\text{m} \end{aligned}$$

- *Conversion Table Method:*

km			m		cm	mm
2	0	0	0			

So,

$$2\,\text{km} = 2\,000\text{m}$$

Ex 21: Convert:

$$4\,\text{m} = \boxed{400}\ \text{cm}.$$

Answer:

- *Multiplication Method:*

$$\begin{aligned} 4\,\text{m} &= 4 \times 100\,\text{cm} \\ &= 400\,\text{cm} \end{aligned}$$

- *Conversion Table Method:*

km			m		cm	mm
			4	0	0	

So,

$$4\,\text{m} = 400\,\text{cm}$$

Ex 22: Convert:

$$300\,\text{cm} = \boxed{3}\ \text{m}.$$

Answer:

- *Division Method:*

$$\begin{aligned} 300\,\text{cm} &= 300 \div 100\,\text{m} \\ &= 3\,\text{m} \end{aligned}$$

- *Conversion Table Method:*

km			m		cm	mm
			3	0	0	

So,

$$300\,\text{cm} = 3\,\text{m}$$

Ex 23: Convert:

$$4\,000\,\text{m} = \boxed{4}\ \text{km}.$$

Answer:

- *Division Method:*

$$\begin{aligned} 4\,000\,\text{m} &= 4\,000 \div 1\,000\,\text{km} \\ &= 4\,\text{km} \end{aligned}$$

- *Conversion Table Method:*

km			m		cm	mm
4	0	0	0			

So,

$$4\,000\,\text{m} = 4\,\text{km}$$

Ex 24: Convert:

$$23\,\text{cm} = \boxed{230}\ \text{mm}.$$

Answer:

- *Multiplication Method:*

$$\begin{aligned} 23\,\text{cm} &= 23 \times 10\,\text{mm} \\ &= 230\,\text{mm} \end{aligned}$$

- *Conversion Table Method:*

km			m		cm	mm
				2	3	0

So,

$$23\,\text{cm} = 230\,\text{mm}$$

Ex 25: Convert:

$$6\,000\,\text{mm} = \boxed{6}\ \text{m}.$$

Answer:

- *Division Method:*

$$\begin{aligned} 6\,000\,\text{mm} &= 6\,000 \div 1\,000\,\text{m} \\ &= 6\,\text{m} \end{aligned}$$

- *Conversion Table Method:*

km			m		cm	mm
			6	0	0	0

So,

$$6\,000\,\text{mm} = 6\,\text{m}$$

C.2 CONVERTING UNITS OF LENGTH WITH DECIMAL NUMBERS

Ex 26: Convert:

$$2.3\,\text{km} = \boxed{2300}\ \text{m}.$$

Answer:

- *Multiplication Method:*

$$\begin{aligned} 2.3\,\text{km} &= 2.3 \times 1\,000\,\text{m} \\ &= 2\,300\,\text{m} \end{aligned}$$

- *Conversion Table Method:*

km			m		cm	mm
2.	3	0	0			

So,

$$2.3\,\text{km} = 2\,300\text{m}$$

Ex 27: Convert:

$$1.60\,\text{m} = \boxed{160}\ \text{cm}.$$

Answer:

- *Multiplication Method:*

$$1.60\,\text{m} = 1.60 \times 100\,\text{cm}$$
$$= 160\,\text{cm}$$

- *Conversion Table Method:*

km			m		cm	mm
			1.	6	0	

So,

$$1.60\,\text{m} = 160\,\text{cm}$$

Ex 28: Convert:

$$22.5\,\text{cm} = \boxed{225}\ \text{mm}.$$

Answer:

- *Multiplication Method:*

$$22.5\,\text{cm} = 22.5 \times 10\,\text{mm}$$
$$= 225\,\text{mm}$$

- *Conversion Table Method:*

km			m		cm	mm
				2	2.	5

So,

$$22.5\,\text{cm} = 225\,\text{mm}$$

Ex 29: Convert:

$$185\,\text{cm} = \boxed{1.85}\ \text{m}.$$

Answer:

- *Division Method:*

$$185\,\text{cm} = 185 \div 100\,\text{m}$$
$$= 1.85\,\text{m}$$

- *Conversion Table Method:*

km			m		cm	mm
			1.	8	5	

So,

$$185\,\text{cm} = 1.85\,\text{m}$$

Ex 30: Convert:

$$2\,300\,\text{m} = \boxed{2.3}\ \text{km}.$$

Answer:

- *Division Method:*

$$2\,300\,\text{m} = 2\,300 \div 1\,000\,\text{km}$$
$$= 2.3\,\text{km}$$

- *Conversion Table Method:*

km			m		cm	mm
2 .	3	0	0			

So,

$$2\,300\,\text{m} = 2.3\,\text{km}$$

Ex 31: Convert:

$$42.2\,\text{km} = \boxed{42200}\ \text{m}.$$

Answer:

- *Multiplication Method:*

$$42.2\,\text{km} = 42.2 \times 1\,000\,\text{m}$$
$$= 42\,200\,\text{m}$$

- *Conversion Table Method:*

	km			m		cm	mm
4	2 ,	2	0	0			

So,

$$42.2\,\text{km} = 42\,200\,\text{m}$$

C.3 SOLVING PROBLEMS WITH UNIT CONVERSIONS

MCQ 32: Hugo and Louis go walking. Louis walks 5 000 meters, and Hugo walks 4.2 kilometers. Who did the longest walk?

☒ Louis

☐ Hugo

Answer: To compare their distances, we need to use the same unit. We can choose to convert either to meters or kilometers as our reference unit. Let's explore both options:
Option 1: Convert to meters (Louis's unit)
Hugo walks 4.2 km. Using the conversion table:

km			m		cm	mm
4.	2	0	0	0		

So, 4.2 km = 4 200 m.
Now, compare:

- Louis: 5 000 m
- Hugo: 4 200 m

Option 2: Convert to kilometers (Hugo's unit)
Louis walks 5 000 m. Using the conversion table:

km			m		cm	mm
5 .	0	0	0			

So, 5 000 m = 5.0 km.
Now, compare:

- Louis: 5.0 km
- Hugo: 4.2 km

In both cases, since 5 000 m (or 5.0 km) is more than 4 200 m (or 4.2 km), Louis did the longest walk.
Why choose kilometers? In the following problems, we'll often convert to kilometers when comparing large distances, like those between places, because kilometers are a more convenient unit for such scales, making the numbers smaller and easier to compare.

MCQ 33: A giraffe is 5.1 meters tall, and a horse is 200 centimeters tall. Which animal is taller?

☒ Giraffe

☐ Horse

Answer: Let's convert the horse's height to meters to compare with the giraffe.
The horse is 200 cm tall. Using the conversion table:

km			m		cm	mm
			2	0	0	

So, 200 cm = 2 m.
Now, compare:

- Giraffe: 5.1 m
- Horse: 2 m

Since 5.1 m is more than 2 m, the giraffe is taller.

MCQ 34: A snake is 3.8 meters long, and a crocodile is 400 centimeters long. Which animal is longer?

☒ Snake

☐ Crocodile

Answer: Let's convert the crocodile's length to meters to compare with the snake.
The crocodile is 400 cm long. Using the conversion table:

km			m		cm	mm
			4	0	0	

So, 400 cm = 4 m.
Now, compare:

- Snake: 3.8 m
- Crocodile: 4 m

Since 4 m is more than 3.8 m, the crocodile is longer.

MCQ 35: Emma walks 2.7 km to school, and Liam walks 3 000 meters to school. Who walks farther?

☒ Emma

☐ Liam

Answer: Let's convert Liam's distance to kilometers to compare with Emma, as kilometers are more convenient for such distances.
Liam walks 3 000 m. Using the conversion table:

km			m		cm	mm
3 .	0	0	0			

So, 3 000 m = 3.0 km.
Now, compare:

- Emma: 2.7 km
- Liam: 3.0 km

Since 3.0 km is more than 2.7 km, Liam walks farther.