

## Precision in car parts

Different car parts need to be manufactured to different degrees of precision. It's important that the length of each manufactured part is recorded correctly, to the correct number of decimal places (d.p.).

### Task 1

The number of decimal places is the number of digits after the decimal place. Look at the numbers in the table and decide how many decimal places they have.

Measurement	Number of decimal places
3.609	
14.85	
178.9072	
9	
1.8	

### Task 2

The door handles have to be 120.3 mm (1 d.p.). Which of these will pass?

Measurement (mm)	To 1 decimal place	Does it pass?
120.3257		
120.3367		
120.6544		
120.3856		
120.2953		

### Task 3

The engine cylinder has to be 120.324 mm (3 d.p.). Which of these pass?

Measurement (mm)	To 3 decimal places	Does it pass?
120.3257		
120.3367		
120.6544		
120.3856		
120.2995		

**Task 4**

The indicator has to be 120 mm (no decimal places). Which of these will pass?

Measurement (mm)	To no decimal places	Does it pass?
120.3257		
120.3367		
120.6544		
120.3856		
120.2953		

**Task 5**

All of the car parts needed to be about 120 mm. Why is it important that scientists use and record the correct number of decimal places?

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**Task 6**

1. Which of the list below do you think should be measured to the highest number of decimal places? Why?

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- a baby’s temperature in an intensive care unit
- a baby’s temperature in a GP’s surgery
- the outside temperature in a newspaper weather forecast
- the temperature of a supermarket freezer

2. Which would need to be measured to the least number of decimal places? Why?

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**Precision in car parts - challenge**

Different car parts need to be manufactured to different degrees of precision. It's important that the length of each manufactured part is recorded correctly, to the correct number of decimal places.

**Task 1**

How many decimal places?

Measurement	Number of decimal places
3.609	
14.85	
178.9072	
9	
1.8	

**Task 2**

The door handles need to be 120.3 mm (correct to 1 d.p.). How many of these handles will be acceptable? Explain your answer.

Measurement (mm)	
120.3257	.....
120.3367	.....
120.6544	.....
120.3856	.....
120.2953	.....

**Task 3**

The engine cylinder needs to be 120.324 mm (correct to 3 d.p.). How many of these handles will be acceptable?

Measurement (mm)	
120.3257	.....
120.3367	.....
120.6544	.....
120.3856	.....
120.2995	.....

**Task 4**

A piece of fabric in the car needs to be 120 mm (no decimal places). How many of these pieces will pass? Explain your answer.

Measurement (mm)
120.3257
120.3367
120.6544
120.3856
120.2953

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**Task 5**

Why is it important that scientists use and record the correct number of decimal places?

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**Task 6**

How many decimal places do you think each of these things should be measured to? Justify your answers.

- A baby’s temperature in an intensive care unit
- A baby’s temperature in a GP’s surgery
- The outside temperature in a newspaper weather forecast
- The temperature of a supermarket freezer

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## Answers

### Task 1

Measurement	Number of decimal places
3.609	3
14.85	2
178.9072	4
9	0
1.8	1

### Task 2

Measurement (mm)	To 1 decimal place	Does it pass?
120.3257	120.3	Yes
120.3367	120.3	Yes
120.6544	120.7	No
120.3856	120.4	No
120.2953	120.3	Yes

### Task 3

Measurement (mm)	To 3 decimal places	Does it pass?
120.3257	120.326	No
120.3367	120.337	No
120.6544	120.654	No
120.3856	120.386	No
120.2995	120.300	No

### Task 4

Measurement (mm)	To no decimal places	Does it pass?
120.3257	120	Yes
120.3367	120	Yes
120.6544	121	No
120.3856	120	Yes
120.2953	120	Yes

### Task 5

All of the car parts needed to be about 120 mm. Why is it important that scientists use and record the correct number of decimal places?

*Different degrees of precision are needed for different parts - the original numbers are the same for each task, but for the most precise requirement, none of the parts passed, whereas for the least precise, 4/5 of the parts passed.*

### Task 6

Which of the list below do you think should be measured to the highest number of decimal places? Why?

*A baby's temp in an intensive care unit. Body temperature needs to stay around 37 °C. Clearly the baby is ill, and any deviation far from the normal temperature will need to be known as it could be critical to survival.*

Which would need to be measured to the least number of decimal places? Why?

*The outdoor temperature in a newspaper weather forecast. It's nice to know the weather forecast, but for most people, a difference of even a few degrees from what is printed isn't even going to be noticed.*