Density - Worksheet

Skill

Group A - Calculating density

Work out the density of each of the following. State the units of each answer:

1) Mass = $8g$,
Volume = $10cm^3$

2) Mass = $8g$,
Volume = $20cm^3$

3) Mass = $75g$,
Volume = $15cm^3$

4) Mass = $75g$,
Volume = $2.5cm^3$

5) Mass = $75g$,
Volume = $0.25m^3$

6) Mass = $7.5g$,
Volume = $0.25cm^3$

7) Mass = $7.25g$,
Volume = $0.25cm^3$

8) Mass = $35kg$,
Volume = $10cm^3$

9) Mass = $35kg$,
Volume = $0.1cm^3$

10) Mass = $35kg$,
Volume = $0.01m^3$

11) Mass = $0.35kg$,
Volume = $0.01cm^3$

12) Mass = $0.35kg$,
Volume = $0.1cm^3$

Group B - Calculating mass

Work out the mass of each of the following. State the units of each answer:

1) Volume = $50cm^3$
Density = $2.7g/cm^3$

2) Volume = $100cm^3$
Density = $2.7g/cm^3$

3) Volume = $100cm^3$
Density = $7.3g/cm^3$

4) Volume = $0.1cm^3$
Density = $7.3g/cm^3$

5) Volume = $0.1m^3$
Density = $7.3g/m^3$

6) Volume = $0.01m^3$
Density = $7.3g/m^3$

7) Volume = $35m^3$
Density = $100kg/m^3$

8) Volume = $3.5m^3$
Density = $100kg/m^3$

9) Volume = $0.35cm^3$
Density = $100kg/cm^3$

10) Volume = $0.035m^3$
Density = $100kg/m^3$

11) Volume = $0.35m^3$
Density = $0.1kg/m^3$

12) Volume = $0.35m^3$
Density = $0.01g/m^3$

Density - Worksheet

Group C - Calculating volume

Work out the volume of each of the following. State the units of each answer:

1) Mass = $5kg$

Density = $8kg/cm^3$

2) Mass = $5kg$

Density = $4kg/cm^3$

3) Mass = $5kg$

Density = $0.4kg/cm^3$

4) Mass = $5g$

Density = $0.4g/cm^3$

5) Mass = $0.5kg$

Density = $0.25kg/m^3$

6) Mass = $7.5kg$

Density = $0.25kg/cm^3$

7) Mass = $10g$

Density = $25g/cm^3$

8) Mass = $35kg$

Density = $100kg/cm^3$

9) Mass = $35g$

Density = $100g/cm^3$

10) Mass = $3.5g$

Density = $100g/cm^3$

11) Mass = $0.35g$

Density = $100g/cm^3$

12) Mass = $0.35g$

Density = $0.1g/cm^3$

Density - Worksheet

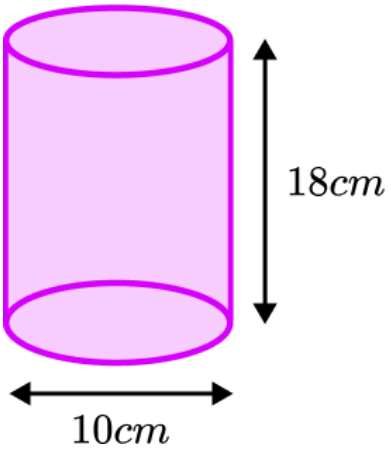
Applied

1) A rod of aluminium has a mass of $575.4g$ and a volume of $210cm^3$.
What is the density of the rod?

2) A statue with a volume of $120cm^3$ made from ceramic has a density of $2g/cm^3$. How much does the statue weigh?

3) A $4kg$ sheet of glass has a density of $2.42g/cm^3$. What is the volume of the glass?

4) Below is a solid cylinder made from carbon.



The density of carbon is $1.94g/cm^3$. Find the mass of the cylinder.

5) The table below shows the density, mass and volume of different objects.

Object	Mass	Volume	Density
A	27kg	1500cm³	
B		250m³	96.2 g/m³
C	8.1g		27 g/cm³

Complete the table.

6) Liquid A has a density of $0.6g/cm^3$.
Liquid B has a density of $1.5g/cm^3$.
$126g$ of liquid A and $126g$ of liquid B are mixed to make liquid C.
Work out the density of liquid C.

Density - Exam Questions

1) Iron has a density of $7.8 g/cm^3$.
A solid iron statue has a mass of $877.5 g$.
Work out the volume of the statue.

.....cm^3
(2 marks)

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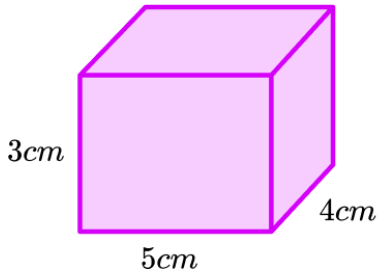
2) The diagram shows a wooden block with density $7 g/cm^3$.



NOT drawn accurately

Calculate the mass of the cube.

.....g
(3 marks)

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3) (a) Iron has a density of $7.8 g/cm^3$.
Calculate the mass of a $3 cm^3$ lump of iron.

.....g
(2)

Density - Exam Questions

(b) Aluminium has a density of $2.7 g/cm^3$.

Calculate the difference between the volume of a $5g$ lump of iron and a $5g$ lump of aluminium.

.....cm^3

(3)

(5 marks)

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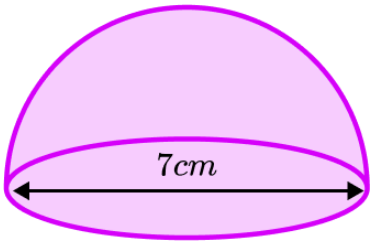
4) Below is a solid glass paperweight.



The paperweight is a hemisphere with diameter $7cm$.

The glass has a density of $3g/cm^3$.

Calculate the mass of the paperweight.

Give your answer correct to 3 significant figures.

.....g

(4 marks)

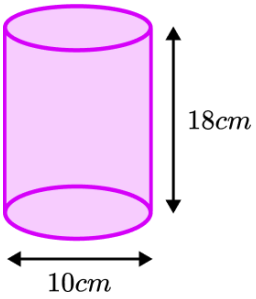
Density - Answers

	Question	Answer
	Skill Questions	
Group A	Work out the density of each of the following. State the units of each answer: **1)** Mass $=8g$, Volume $=10cm^3$ **2)** Mass $=8g$, Volume $=20cm^3$ **3)** Mass $=75g$, Volume $=15cm^3$ **4)** Mass $=75g$, Volume $=2.5cm^3$ **5)** Mass $=75g$, Volume $=0.25m^3$ **6)** Mass $=7.5g$, Volume $=0.25cm^3$ **7)** Mass $=7.25g$, Volume $=0.25cm^3$ **8)** Mass $=35kg$, Volume $=10cm^3$ **9)** Mass $=35kg$, Volume $=0.1cm^3$ **10)** Mass $=35kg$, Volume $=0.01m^3$ **11)** Mass $=0.35kg$, Volume $=0.01cm^3$ **12)** Mass $=0.35kg$, Volume $=0.1cm^3$	**1)** $0.8g/cm^3$ **2)** $0.4g/cm^3$ **3)** $5g/cm^3$ **4)** $30g/cm^3$ **5)** $300g/m^3$ **6)** $30g/cm^3$ **7)** $29g/cm^3$ **8)** $3.5kg/cm^3$ **9)** $350kg/cm^3$ **10)** $3500kg/m^3$ **11)** $35kg/cm^3$ **12)** $3.5kg/cm^3$
Group B	Work out the mass of each of the following. State the units of each answer: **1)** Volume $=50cm^3$, Density $=2.7g/cm^3$ **2)** Volume $=100cm^3$, Density $=2.7g/cm^3$ **3)** Volume $=100cm^3$, Density $=7.3g/cm^3$ **4)** Volume $=0.1cm^3$, Density $=7.3g/cm^3$ **5)** Volume $=0.1m^3$, Density $=7.3g/m^3$ **6)** Volume $=0.01m^3$, Density $=7.3g/m^3$	**1)** $135g$ **2)** $270g$ **3)** $730g$ **4)** $0.73g$ **5)** $0.73g$ **6)** $0.073g$

Density - Answers

Group B contd	**7)** Volume = $35m^3$, Density = $100kg/m^3$ **8)** Volume = $3.5m^3$, Density = $100kg/m^3$ **9)** Volume = $0.35cm^3$, Density = $100kg/cm^3$ **10)** Volume = $0.035m^3$,Density = $100kg/m^3$ **11)** Volume = $0.35m^3$, Density = $0.1kg/m^3$ **12)** Volume = $0.35m^3$, Density = $0.01g/m^3$	**7)** $3500kg$ **8)** $350kg$ **9)** $35kg$ **10)** $3.5kg$ **11)** $0.035kg$ **12)** $0.0035kg$
Group C	Work out the volume of each of the following. State the units of each answer: **1)** Mass = $5kg$, Density = $8kg/cm^3$ **2)** Mass = $5kg$, Density = $4kg/cm^3$ **3)** Mass = $5kg$, Density = $0.4kg/cm^3$ **4)** Mass = $5g$, Density = $0.4g/cm^3$ **5)** Mass = $0.5kg$, Density = $0.25kg/m^3$ **6)** Mass = $7.5kg$, Density = $0.25kg/cm^3$ **7)** Mass = $10g$, Density = $25g/cm^3$ **8)** Mass = $35kg$, Density = $100kg/cm^3$ **9)** Mass = $35g$, Density = $100g/cm^3$ **10)** Mass = $3.5g$, Density = $100g/cm^3$ **11)** Mass = $0.35g$, Density = $100g/cm^3$ **12)** Mass = $0.35g$, Density = $0.1g/cm^3$	 **1)** $0.625cm^3$ **2)** $1.25cm^3$ **3)** $12.5cm^3$ **4)** $12.5cm^3$ **5)** $2m^3$ **6)** $30cm^3$ **7)** $0.4cm^3$ **8)** $0.35cm^3$ **9)** $0.35cm^3$ **10)** $0.035cm^3$ **11)** $0.0035cm^3$ **12)** $3.5cm^3$

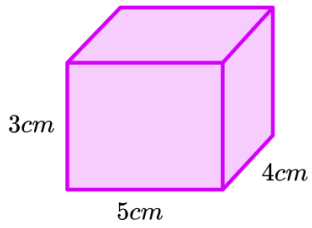
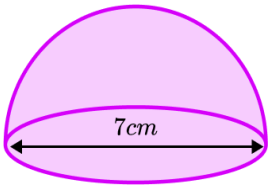
Density - Answers

	Question	Answer
	Applied Questions	
1)	A rod of aluminium has a mass of $575.4g$ and a volume of $210cm^3$. What is the density of the rod?	$2.74g/cm^3$
2)	A statue with a volume of $120cm^3$ made from ceramic has a density of $2g/cm^3$. How much does the statue weigh?	$240g$
3)	A $4kg$ sheet of glass has a density of $2.42g/cm^3$. What is the volume of the glass?	$1652.89cm^3$ (to 2dp)
4)	Below is a solid cylinder made from carbon.  The density of carbon is $1.94g/cm^3$. Find the mass of the cylinder.	Volume = $\pi \times 5^2 \times 18 = 450\pi$ Mass = $1.94 \times 450\pi$ $2743g$ (to the nearest g)
5)	The table below shows the density, mass and volume of different objects. Complete the table.	
6)	Liquid A has a density of $0.6g/cm^3$. Liquid B has a density of $1.5g/cm^3$. $126g$ of liquid A and $126g$ of liquid B are mixed to make liquid C. Work out the density of liquid C.	Volume A = $126 \div 0.6 = 210$ Volume B = $126 \div 1.5 = 84$ Density of C = $(126 + 126) \div (210 + 84)$ $= 0.857g/cm^3$ (to 3sf)

Object	Mass	Volume	Density
A	27kg	1500cm³	
B		250m³	96.2 g/m³
C	8.1g		27 g/cm³

Object	Mass	Volume	Density
A	27kg	1500cm³	0.018 kg/cm³
B	24050g	250m³	96.2 g/m³
C	8.1g	0.3cm³	27 g/cm³

Density - Answers

	Question	Answer	
	Exam Questions		
1)	Iron has a density of $7.8g/cm^3$. A solid iron statue has a mass of $877.5g$. Work out the volume of the statue.	$877.5 \div 7.8$ $112.5cm^3$	(1) (1)
2)	The diagram shows a wooden block with density $7g/cm^3$.  Calculate the mass of the cube.	Volume = $60cm^3$ 60×7 $420g$	(1) (1) (1)
3) (a)	Iron has a density of $7.8g/cm^3$. Calculate the mass of a $3cm^3$ lump of iron.	(a) 7.8×3 $23.4g$	(1) (1)
(b)	Aluminium has a density of $2.7g/cm^3$. Calculate the difference between the volume of a $5g$ lump of iron and a $5g$ lump of aluminium.	(b) Volume Iron = $0.6410...cm^3$ Volume Aluminium = $1.8518...cm^3$ $1.21cm^3$	(1) (1) (1)
4)	Below is a solid glass paperweight.  The paperweight is a hemisphere with diameter $7cm$. The glass has a density of $3g/cm^3$. Calculate the mass of the paperweight. Give your answer correct to 3 significant figures.	$\frac{4}{3} \times \pi \times 3.5^3$ or $179.59...$ $179.59... \div 2 = 89.797...$ $3 \times 89.797...$ $269g$	(1) (1) (1) (1)