

## **Density - Worksheet**

#### Skill

#### Group A - Calculating density

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

<b>1</b> ) Mass = 8 <i>g</i> ,	<b>2)</b> Mass = 8 <i>g</i> ,	<b>3)</b> Mass = 75 <i>g</i> ,
Volume =10cm <sup>3</sup>	Volume = 20 $cm^3$	Volume = $15cm^3$
<b>4)</b> Mass = 75 <i>g</i> ,	<b>5)</b> Mass = 75 <i>g</i> ,	<b>6)</b> Mass = 7.5 <i>g</i> ,
Volume = $2.5cm^3$	Volume = 0. 25 <i>m</i> <sup>3</sup>	Volume = 0. 25 <i>cm</i> <sup>3</sup>
<b>7)</b> Mass = 7.25 <i>g</i> ,	<b>8)</b> Mass = 35 <i>kg</i> ,	<b>9)</b> Mass = 35 <i>kg</i> ,
Volume = 0. 25 <i>cm</i> <sup>3</sup>	Volume = $10cm^3$	Volume = $0.1cm^3$
<b>10)</b> Mass = 35kg,	<b>11)</b> Mass = $0.35kg$ ,	<b>12)</b> Mass = $0.35kg$ ,
Volume = $0.01m^3$	Volume = $0.01cm^3$	Volume = $0.1 cm^3$

#### Group B - Calculating mass

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

<b>1)</b> Volume = $50cm^3$	<b>2)</b> Volume = $100cm^3$	<b>3)</b> Volume = $100cm^3$
Density = 2.7 <i>g</i> / <i>cm</i> <sup>3</sup>	Density = 2.7g/cm <sup>3</sup>	Density = $7.3g/cm^3$
<b>4)</b> Volume = $0.1cm^3$	<b>5)</b> Volume = $0.1m^3$	6) Volume = $0.01m^3$
Density = $7.3g/cm^3$	Density = $7.3g/m^3$	Density = $7.3g/m^3$
<b>7)</b> Volume = $35m^3$	8) Volume = $3.5m^3$	<b>9)</b> Volume = $0.35cm^3$
Density = $100kg/m^3$	Density = $100kg/m^3$	Density = $100kg/cm^3$
<b>10)</b> Volume = $0.035m^3$	<b>11)</b> Volume = $0.35m^3$	<b>12)</b> Volume = $0.35m^3$
Density = $100kg/m^3$	Density = $0.1kg/m^3$	Density = $0.01g/m^3$

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## **Density - Worksheet**

#### Group C - Calculating volume

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

<b>1)</b> Mass = 5kg	<b>2)</b> Mass = 5kg	<b>3)</b> Mass = 5 <i>kg</i>
Density = $8kg/cm^3$	Density = $4kg/cm^3$	Density = $0.4kg/cm^3$
<b>4)</b> Mass = $5g$	<b>5)</b> Mass = $0.5kg$	<b>6)</b> Mass = 7. $5kg$
Density = $0.4g/cm^3$	Density = $0.25kg/m^3$	Density = 0. $25kg/cm^3$
<b>7)</b> Mass = $10g$	<b>8)</b> Mass = $35kg$	<b>9)</b> Mass = $35g$
Density = $25g/cm^3$	Density = $100kg/cm^3$	Density = $100g/cm^3$
<b>10)</b> Mass = $3.5g$	<b>11)</b> Mass = $0.35g$	<b>12)</b> Mass = $0.35g$
Density = $100g/cm^3$	Density = $100g/cm^3$	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
А	27kg	1500cm <sup>3</sup>	
В		250m³	96.2 g/m³
с	8.1g		27 g/cm³

Complete the table.

6) Liquid A has a density of 0. 6g/cm<sup>3</sup>.
Liquid B has a density of 1. 5g/cm<sup>3</sup>.
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.  $8g/cm^3$ . A solid iron statue has a mass of 877. 5g. Work out the volume of the statue.

> .....*cm*<sup>3</sup> (2 marks)



.....g (3 marks)

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

> .....g (2)



### **Density - Exam Questions**

**(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.

cm <sup>3</sup>	 		
(3)			
(5 marks)			

4) Below is a solid glass paperweight.



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

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)



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



Group B	<b>7)</b> Volume = $35m^3$ , Density = $100kg/m^3$	<b>7)</b> 3500kg
contd	<b>8)</b> Volume = $3.5m^3$ , Density = $100kg/m^3$	<b>8)</b> 350kg
	<b>9)</b> Volume = $0.35cm^3$ , Density = $100kg/cm^3$	<b>9)</b> 35kg
	<b>10)</b> Volume = $0.035m^3$ , Density = $100kg/m^3$	<b>10)</b> 3. 5kg
	<b>11)</b> Volume = $0.35m^3$ , Density = $0.1kg/m^3$	<b>11)</b> 0.035kg
	<b>12)</b> Volume = $0.35m^3$ , Density = $0.01g/m^3$	<b>12)</b> 0.0035kg
Group C	Work out the volume of each of the following. State the units of each answer:	
	<b>1)</b> Mass = $5kg$ , Density = $8kg/cm^3$	<b>1)</b> $0.625cm^3$
	<b>2)</b> Mass = $5kg$ , Density = $4kg/cm^3$	<b>2)</b> 1.25 <i>cm</i> <sup>3</sup>
	<b>3)</b> Mass = $5kg$ , Density = $0.4kg/cm^3$	<b>3)</b> 12. 5 <i>cm</i> <sup>3</sup>
	<b>4)</b> Mass = 5 <i>g</i> , Density = $0.4g/cm^3$	<b>4)</b> 12. $5cm^3$
	<b>5)</b> Mass = $0.5kg$ , Density = $0.25kg/m^3$	<b>5)</b> $2m^3$
	<b>6)</b> Mass = 7. $5kg$ , Density = $0.25kg/cm^3$	<b>6)</b> 30 <i>cm</i> <sup>3</sup>
	<b>7)</b> Mass = $10g$ , Density = $25g/cm^3$	<b>7)</b> 0. $4cm^3$
	<b>8)</b> Mass = $35kg$ , Density = $100kg/cm^3$	<b>8)</b> 0. 35 <i>cm</i> <sup>3</sup>
	<b>9)</b> Mass = $35g$ , Density = $100g/cm^3$	<b>9)</b> 0. 35 <i>cm</i> <sup>3</sup>
	<b>10)</b> Mass = 3.5 $g$ , Density = $100g/cm^3$	<b>10)</b> 0. 035 <i>cm</i> <sup>3</sup>
	<b>11)</b> Mass = $0.35g$ , Density = $100g/cm^3$	<b>11)</b> 0.0035 <i>cm</i> <sup>3</sup>
	<b>12)</b> Mass = $0.35g$ , Density = $0.1g/cm^3$	<b>12)</b> 3. 5 <i>cm</i> <sup>3</sup>



	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?	2.74 $g/cm^3$
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?	240 <i>g</i>
3)	A $4kg$ sheet of glass has a density of 2. $42g/cm^3$ . What is the volume of the glass?	1652.89 <i>cm</i> <sup>3</sup> (to 2dp)
4)	Below is a solid cylinder made from carbon. $\qquad \qquad $	Volume = $\pi \times 5^2 \times 18 = 450\pi$ Mass = 1.94 × 450 $\pi$ 2743g (to the nearest g)
5)	The table below shows the density, mass and volume of different objects.         Object       Mass       Volume       Density         A       27kg       1500cm <sup>3</sup> 1500cm <sup>3</sup> B       250m <sup>3</sup> 96.2 g/m <sup>3</sup> C       8.1g       27 g/cm <sup>3</sup> Complete the table.	Object         Mass         Volume         Density           A         27kg         1500cm <sup>3</sup> 0.018 kg/cm <sup>3</sup> B         24050g         250m <sup>3</sup> 96.2 g/m <sup>3</sup> C         8.1g         0.3cm <sup>3</sup> 27 g/cm <sup>3</sup>
6)	Complete the table. 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 = $(126 + 126) \div (210 + 84)$



		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.	$877.5 \div 7.8$ 112.5 $cm^3$	(1) (1)
2)		The diagram shows a wooden block with density $7g/cm^3$ . 3cm $4cm$ $5cm$ NOT drawn $accurately$ Calculate the mass of the cube.	Volume = $60cm^3$ $60 \times 7$ 420g	(1) (1) (1)
3)	(a)	Iron has a density of 7.8 $g/cm^3$ . Calculate the mass of a $3cm^3$ lump of iron.	(a) $7.8 \times 3$ 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 = $0.6410cm^3$ Volume Aluminium = $1.8518cm^3$ $1.21cm^3$	(1) (1) (1)
4)		Below is a solid glass paperweight. The paperweight is a hemisphere with diameter 7 <i>cm</i> . The glass has a density of $3g/cm^3$ . Calculate the mass of the paperweight. Give your answer correct to 3 significant figures.	$\frac{4}{3} \times \pi \times 3.5^{3} \text{ or } 179.59$ 179.59 ÷ 2 = 89.797 3 × 89.797 269g	<ul> <li>(1)</li> <li>(1)</li> <li>(1)</li> <li>(1)</li> </ul>

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