THIRD SPACE
LEARNING

Standard Form - Worksheet

Skill

Group A - Positive powers

Work out the following:

1) Write 8×10^5 as an ordinary number

2) Write 8.4×10^5 as an ordinary number

3) Write $2,000$ in standard form

4) Write $2,100$ in standard form

5) $(8 \times 10^5) \times (2 \times 10^4)$

6) $(8.4 \times 10^5) \times (2.1 \times 10^4)$

7) $(8 \times 10^5) \div (2 \times 10^4)$

8) $(8.4 \times 10^5) \div (2.1 \times 10^4)$

9) $(8 \times 10^5) + (2 \times 10^4)$

10) $(8.4 \times 10^5) + (2.1 \times 10^4)$

11) $(8 \times 10^5) - (2 \times 10^4)$

12) $(8.4 \times 10^5) - (2.1 \times 10^4)$

Group B - Negative powers

Work out:

1) Write 6×10^{-4} as an ordinary number

2) Write 6.3×10^{-4} as an ordinary number

3) Write 0.00002 in standard form

4) Write 0.000021 in standard form

5) $(6 \times 10^{-4}) \times (2 \times 10^{-5})$

6) $(6.3 \times 10^{-4}) \times (2.1 \times 10^{-5})$

7) $(6 \times 10^{-4}) \div (2 \times 10^{-5})$

8) $(6.3 \times 10^{-4}) \div (2.1 \times 10^{-5})$

9) $(6 \times 10^{-4}) + (2 \times 10^{-5})$

10) $(6.3 \times 10^{-4}) + (2.1 \times 10^{-5})$

11) $(6 \times 10^{-4}) - (2 \times 10^{-5})$

12) $(6.3 \times 10^{-4}) - (2.1 \times 10^{-5})$

Standard Form - Worksheet

Group C - Mixed powers

Work out:

1) Convert 42×10^6 to standard form

2) Convert 42×10^{-3} to standard form

3) Convert 0.84×10^5 to standard form

4) Convert 0.084×10^{-7} to standard form

5) $(4 \times 10^6) \times (8 \times 10^4)$

6) $(4 \times 10^{-5}) \times (8 \times 10^{-7})$

7) $(4 \times 10^6) \div (8 \times 10^4)$

8) $(4 \times 10^{-5}) \div (8 \times 10^{-7})$

9) $(4 \times 10^6) + (8 \times 10^4)$

10) $(4 \times 10^{-5}) + (8 \times 10^{-7})$

11) $(4 \times 10^6) - (8 \times 10^4)$

12) $(4 \times 10^{-5}) - (8 \times 10^{-7})$

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Standard Form - Worksheet

Applied

1) **(a)** The distance from Earth to the moon is $380,000 \, km$ rounded to 2 significant figures. Write this number in standard form.

(b) The average speed of a space shuttle is $2.8 \times 10^4 \, km/h$. Calculate how long you would expect a space shuttle to travel from Earth to the moon.

2) **(a)** The average ant has a mass of $4 \times 10^{-6} \, kg$. Write this as an ordinary number.

(b) The average butterfly has a mass of $5 \times 10^{-2} \, kg$. How much greater is the mass of a butterfly compared to the mass of an ant?

3) The population of China is 1.4×10^9 people, rounded to 2 significant figures. The population of the UK is 6.6×10^7 people, rounded to 2 significant figures. How many fewer people live in the UK compared to China?

4) **(a)** The distance of the Earth's orbit around the sun is 9.3×10^7 miles. It takes one year for the Earth to orbit the sun. What would be the distance that the Earth travels around the sun in a total of 300 years?

(b) A day on earth is approximately 0.0027 of a year. How far does the Earth travel around the sun in one day?

Standard Form - Exam Questions

1) **(a)** Write 6.12×10^{-4} as an ordinary number.

....
(1)

(b) Write 0.00029 in standard form.

....
(1)
(2 marks)

2) **(a)** Work out the value of
$(2.3 \times 10^{4}) \times (4.1 \times 10^{5})$. Give your
answer in standard form.

....
(2)

(b) How many times larger is (5.1×10^{8}) than
(3.2×10^{6})? Write your answer as an ordinary
number.

....
(2)
(4 marks)

3) Put these numbers in order of size. Start with the
smallest.

$$0.00082, 2.8 \times 10^{-3},$$
$$0.208 \times 10^{-5}, 0.000802$$

....
(2 marks)

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Standard Form - Exam Questions

4) **(a)** This table shows the population of some countries.

....
(1)

Country	Population
UK	6.6×10^{7}
India	1.37×10^{8}
Iceland	3.57×10^{5}
Japan	1.26×10^{8}
China	1.4×10^{9}

Which country has the smallest population?

(b) What is the difference in population between Japan and the UK?

....
(2)
(3 marks)

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Standard Form - Answers

	Question	Answer
Group A	Skill questions	
	Work out: **1)** Write 8×10^5 as an ordinary number **2)** Write 8.4×10^5 as an ordinary number **3)** Write $2,000$ in standard form **4)** Write $2,100$ in standard form **5)** $(8 \times 10^5) \times (2 \times 10^4)$ **6)** $(8.4 \times 10^5) \times (2.1 \times 10^4)$ **7)** $(8 \times 10^5) \div (2 \times 10^4)$ **8)** $(8.4 \times 10^5) \div (2.1 \times 10^4)$ **9)** $(8 \times 10^5) + (2 \times 10^4)$ **10)** $(8.4 \times 10^5) + (2.1 \times 10^4)$ **11)** $(8 \times 10^5) - (2 \times 10^4)$ **12)** $(8.4 \times 10^5) - (2.1 \times 10^4)$	**1)** $800,000$ **2)** $840,000$ **3)** 2×10^3 **4)** 2.1×10^3 **5)** 1.6×10^{10} **6)** 1.764×10^{10} **7)** 4×10^1 **8)** 4×10^1 **9)** 8.2×10^5 **10)** 8.61×10^5 **11)** 7.8×10^5 **12)** 8.19×10^5
Group B	Work out: **1)** Write 6×10^{-4} as an ordinary number **2)** Write 6.3×10^{-4} as an ordinary number **3)** Write 0.00002 in standard form **4)** Write 0.000021 in standard form **5)** $(6 \times 10^{-4}) \times (2 \times 10^{-5})$ **6)** $(6.3 \times 10^{-4}) \times (2.1 \times 10^{-5})$ **7)** $(6 \times 10^{-4}) \div (2 \times 10^{-5})$ **8)** $(6.3 \times 10^{-4}) \div (2.1 \times 10^{-5})$ **9)** $(6 \times 10^{-4}) + (2 \times 10^{-5})$ **10)** $(6.3 \times 10^{-4}) + (2.1 \times 10^{-5})$ **11)** $(6 \times 10^{-4}) - (2 \times 10^{-5})$ **12)** $(6.3 \times 10^{-4}) - (2.1 \times 10^{-5})$	**1)** 0.0006 **2)** 0.00063 **3)** 2×10^{-5} **4)** 2.1×10^{-5} **5)** 1.2×10^{-8} **6)** 1.323×10^{-8} **7)** 3×10^1 **8)** 3×10^1 **9)** 6.2×10^{-4} **10)** 6.51×10^{-4} **11)** 5.8×10^{-4} **12)** 6.09×10^{-4}

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Standard Form - Answers

	Question	Answer
Group C	Skill questions	
	Work out: **1)** Convert 42×10^{6} to standard form **2)** Convert 42×10^{-3} to standard form **3)** Convert 0.84×10^{5} to standard form **4)** Convert 0.084×10^{-7} to standard form **5)** $(4 \times 10^{6}) \times (8 \times 10^{4})$ **6)** $(4 \times 10^{-5}) \times (8 \times 10^{-7})$ **7)** $(4 \times 10^{6}) \div (8 \times 10^{4})$ **8)** $(4 \times 10^{-5}) \div (8 \times 10^{-7})$ **9)** $(4 \times 10^{6}) + (8 \times 10^{4})$ **10)** $(4 \times 10^{-5}) + (8 \times 10^{-7})$ **11)** $(4 \times 10^{6}) - (8 \times 10^{4})$ **12)** $(4 \times 10^{-5}) - (8 \times 10^{-7})$	**1)** 4.2×10^{7} **2)** 4.2×10^{-2} **3)** 8.4×10^{4} **4)** 8.4×10^{-9} **5)** 3.2×10^{11} **6)** 3.2×10^{-11} **7)** 5×10^{1} **8)** 5×10^{1} **9)** 4.08×10^{6} **10)** 4.08×10^{-5} **11)** 3.92×10^{6} **12)** 3.92×10^{-5}

Standard Form - Answers

	Question	Answer
	Applied Questions	
1)	**(a)** The distance from Earth to the moon is $380,000\,km$ rounded to 2 significant figures. Write this number in standard form. **(b)** The average speed of a space shuttle is $2.8 \times 10^4\,km/h$. Calculate how long you would expect a space shuttle to travel from Earth to the moon.	**(a)** 3.8×10^5 **(b)** $13.6\,hours$
2)	**(a)** The average ant has a mass of $4 \times 10^{-6}\,kg$. Write this as an ordinary number. **(b)** The average butterfly has a mass of $5 \times 10^{-2}\,kg$. How much greater is the mass of a butterfly compared to the mass of an ant?	**(a)** $0.000004\,kg$ **(b)** $0.0499\,kg$
3)	The population of China is 1.4×10^9 people, rounded to 2 significant figures. The population of the UK is 6.6×10^7 people, rounded to 2 significant figures. How many fewer people live in the UK compared to China?	1.434×10^9
4)	**(a)** The distance of the Earth's orbit around the sun is 9.3×10^7 miles. It takes one year for the Earth to orbit the sun. What would be the distance that the Earth travels around the sun in a total of 300 years?	**(a)** $2.79 \times 10^{10}\,miles$
	(b) A day on earth is approximately 0.0027 of a year. How far does the Earth travel around the sun in one day?	**(b)** $251100\,miles$

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Standard Form - Mark Scheme

		Question	Answer	
		Exam Questions		
1)	**(a)**	Write 6.12×10^{-4} as an ordinary number.	**(a)** $\quad 0.000612$ A1: Correct answer only	**(1)**
	(b)	Write 0.00029 in standard form.	**(b)** $\quad 2.9 \times 10^{-4}$ A1: Correct answer only	**(1)**
2)	**(a)**	Work out the value of $(2.3 \times 10^4) \times (4.1 \times 10^5)$. Give your answer in standard form.	**(a)** $\quad 9.43 \times 10^9$ M1: multiplication of numbers or addition of powers. A1: Correct answer only	**(2)**
	(b)	How many times larger is (5.1×10^8) than (3.2×10^6)? Write your answer as an ordinary number.	**(b)** $\quad 159$ (3 sig fig) M1: division of numbers or subtraction of powers. A1: Correct answer only	**(2)**

Standard Form - Mark Scheme

3)	Put these numbers in order of size. Start with the smallest. $$0.00082, 2.8 \times 10^{-3},$$ $$0.208 \times 10^{-5}, 0.000802$$	$$0.208 \times 10^{-5}, 0.000802,$$ $$0.00082, 2.8 \times 10^{-3}$$ M1: If correctly converts all numbers to the same format for comparison A1: If 3 numbers are correctly placed	**(2)**
4) (a)	This table shows the population of some countries. <table><tr><th>Country</th><th>Population</th></tr><tr><td>UK</td><td>6.6×10^7</td></tr><tr><td>India</td><td>1.37×10^8</td></tr><tr><td>Iceland</td><td>3.57×10^5</td></tr><tr><td>Japan</td><td>1.26×10^8</td></tr><tr><td>China</td><td>1.4×10^9</td></tr></table> Which country has the smallest population?	**(a)** Iceland A1: Correct answer only	**(1)**
(b)	What is the difference in population between Japan and the UK?	**(b)** 6×10^7 M1: subtraction of values A1: Correct answer only	**(2)**