

Pack Contents

Planet Data Table

Planet Cards

Activity Sheets

- Writing Whole Numbers
(★ and ★★★)
- Rounding
(★, ★★, ★★★ and Answers)
- Standard Form
(★★★ and Answers)
- Ordering positive and negative numbers
(★ and Answers)
- Finding differences between positive and negative numbers
(★★, ★★★ and Answers)
- Mental Arithmetic: Addition and subtraction of positive and negative numbers
(★, ★★, ★★★ and Answers)
- Calculating with Time
(Mixed Ability and Answers)
- Circle and Sphere calculations
(★★, ★★★ and Answers)

Differentiaion:

★ Easy ★★ Medium ★★★ Hard

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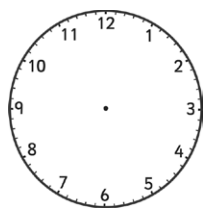
Differentiaion:

★ Easy ★★ Medium ★★★ Hard

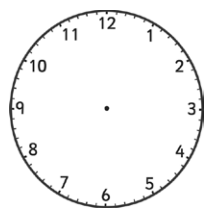
Calculating with Time

If each planet starts 1 rotation on 1st September 2015 at 9:00am can you work out when each planet rotation will end?
Write down the correct **time** and **date**.

Planet	1 Rotation	End Time and Date
Mars ★	24 hours 37 minutes	
Mercury ★★	59 days	
Venus ★★★	243 days	
Neptune ★	16 hours 17 minutes	
Earth ★	23 hours 56 minutes	
Uranus ★★★	17 hours 12 minutes	
Jupiter ★	9 hours 55 minutes	
Saturn ★	10 hours 13 minutes	



12 hour 24 hour
--:-- --:--



12 hour 24 hour
--:-- --:--



12 hour 24 hour
--:-- --:--



12 hour 24 hour
--:-- --:--

Can you show the correct rotation end times on:

- analogue clock?
- 12 hour digital clock?
- 24 hour digital clock?



12 hour 24 hour
--:-- --:--



12 hour 24 hour
--:-- --:--



12 hour 24 hour
--:-- --:--



12 hour 24 hour
--:-- --:--

And mark the correct day on the calendar?

Sep	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Oct	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Nov	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Dec	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Jan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Feb	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
Mar	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Apr	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
May	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Jun	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Jul	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Aug	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Calculating with **Time** Answers

If each planet starts 1 rotation on 1st September 2015 at 9:00am can you work out when each planet rotation will end? Write down the correct time and date.

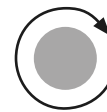
Planet	1 Rotation	End Time and Date
Mars ★	24 hours 37 minutes	2nd September 9:37am
Mercury ★★	59 days	30th October 9:00am
Venus ★★★	243 days	1st May 9:00am
Neptune ★	16 hours 17 minutes	2nd September 1:17am
Earth ★	23 hours 56 minutes	2nd September 8:56am
Uranus ★★★	17 hours 12 minutes	2nd September 2:12am
Jupiter ★	9 hours 55 minutes	1st September 6:55pm
Saturn ★	10 hours 13 minutes	1st September 7:13pm

Circle and Sphere Calculations

Planet	Diameter (km)	Radius (km)	Circumference (km)
Mars	6 794		
Mercury	4 876		
Venus	12 107		
Neptune	49 527		
Earth	12 775		
Uranus	51 117		

Circumference of a sphere

$$c = 2\pi r$$



If your calculator does not have a π button, use **3.14**

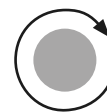


Circle and Sphere Calculations

Planet	Diameter (km)	Radius (km)	Circumference (km)
Mars	6 794		
Mercury	4 876		
Venus	12 107		
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Earth	12 775		
Uranus	51 117		

Circumference of a sphere

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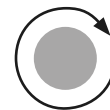


Circle and Sphere Calculations

Planet	Diameter (km)	Circumference (km)	Surface Area (km ²)	Surface area Rounded to nearest 100 000 (km ²)	Surface Area Standard Form (km ²)
Mars	6 794				
Mercury	4 876				
Venus	12 107				
Neptune	49 527				
Earth	12 775				
Uranus	51 117				

Circumference of a sphere

$$c = 2\pi r$$



Surface area of a sphere

$$a = 4\pi r^2$$

If you really want to fry your brain, try finding the volume of each planet!

$$v = \frac{4\pi r^3}{3}$$

If your calculator does not have a π button, use **3.14**

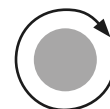


Circle and Sphere Calculations

Planet	Diameter (km)	Circumference (km)	Surface Area (km ²)	Surface Area Rounded to nearest 100 000 (km ²)	Surface Area Standard Form (km ²)
Mars	6 794				
Mercury	4 876				
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Circle and Sphere Calculations Answers

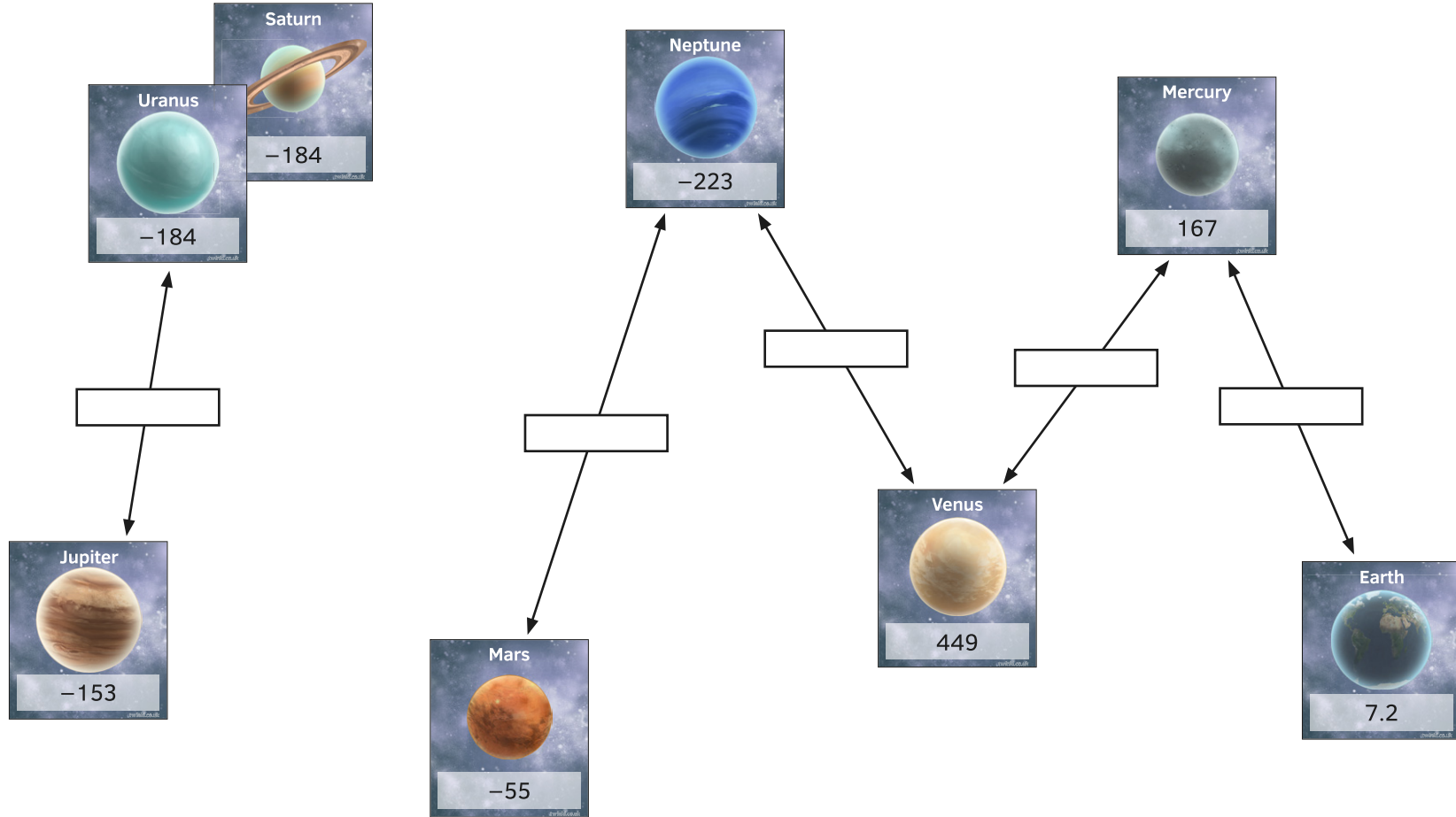
Planet	Diameter (km)	Radius (km)	Circumference (km)
Mars	6 794	3 397	21 343.98
Mercury	4 876	2 438	15 318.41
Venus	12 107	6 053.5	38 035.26
Neptune	49 527	24 763.5	155 593.66
Earth	12 775	6 377.5	40 071.01
Uranus	51 117	25 558.5	160 588.79

Circle and Sphere Calculations Answers

Planet	Diameter (km)	Circumference (km)	Surface Area (km ²)	Surface Area rounded to nearest 100 000 (km ²)	Surface Area Standard Form (km ²)
Mars	6 794	21 343.98	145 011 003.4	145 000 000	1.45×10^8
Mercury	4 876	15 318.41	74 962 546.58	74 700 000	7.47×10^7
Venus	12 107	38 035.26	460 416 852.8	460 400 000	4.604×10^8
Neptune	49 527	155 593.66	7 706 087 167	7 706 100 000	7.7061×10^9
Earth	12 775	40 071.01	511 105 787.4	511 100 000	5.111×10^8
Uranus	51 117	160 588.79	8 208 817 264	8 208 800 000	8.2088×10^9

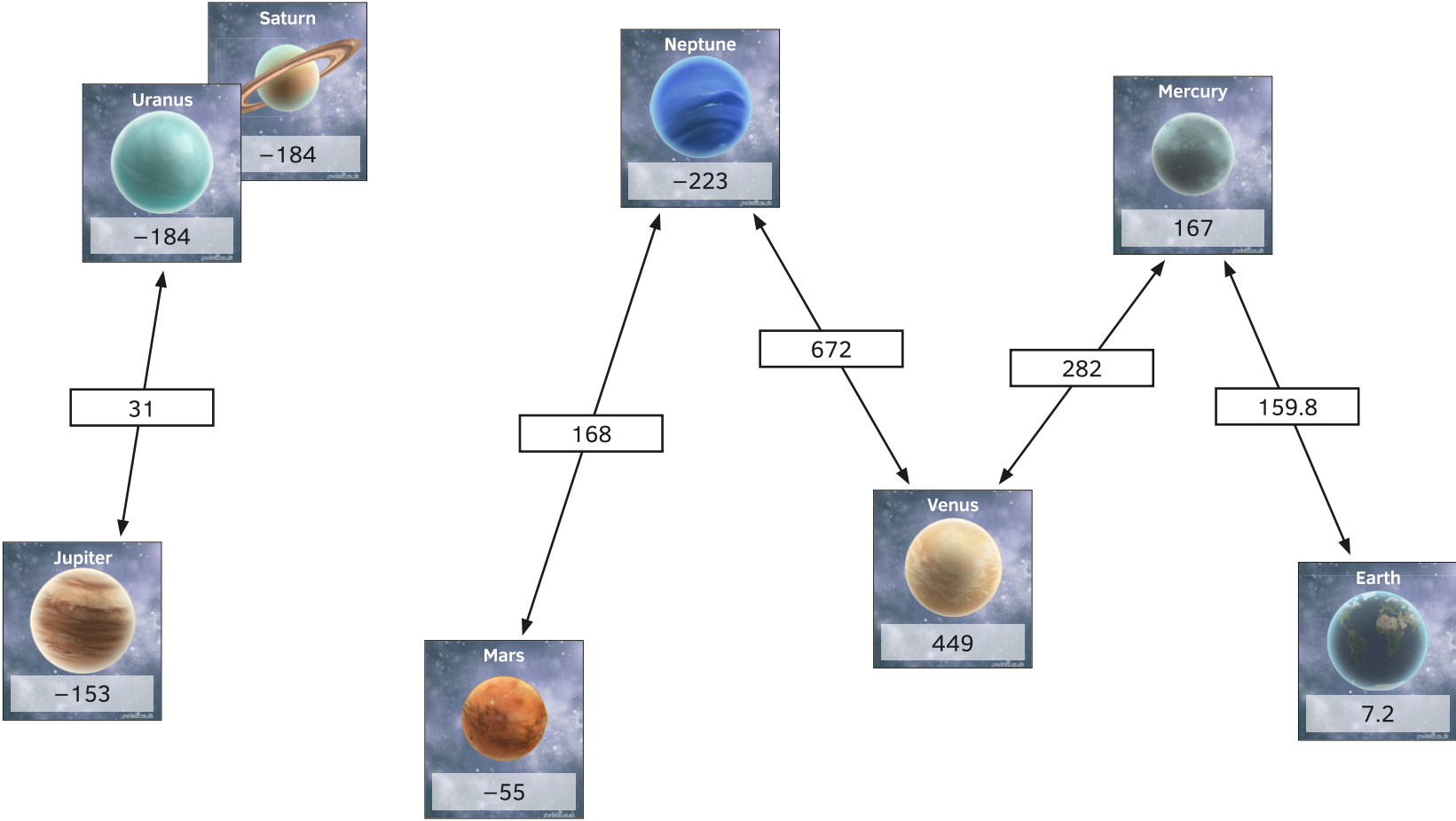
Finding Differences Between Positive and Negative Numbers

Calculate the temperature differences between the planets.
How many others can you find?



Finding Differences Between Positive and Negative Numbers Answers

Calculate the temperature differences between the planets.
How many others can you find?



Finding Differences Between Positive and Negative Numbers

Show temperature differences between all of the different planets.

Planet	Average Temperature (°c)
Mars	-55
Mercury	167
Venus	449
Neptune	-223
Earth	7.2
Uranus	-184
Jupiter	-153
Saturn	-184

Temperature Differences (°c)	Mars	Mercury	Venus	Neptune	Earth	Uranus	Jupiter	Saturn
Mars								
Mercury								
Venus								
Neptune								
Earth								
Uranus								
Jupiter								
Saturn								

Finding Differences Between Positive and Negative Numbers Answers

Planet	Average Temperature (°C)
Mars	-55
Mercury	167
Venus	449
Neptune	-223
Earth	7.2
Uranus	-184
Jupiter	-153
Saturn	-184

Temperature Differences (°C)	Mars	Mercury	Venus	Neptune	Earth	Uranus	Jupiter	Saturn
Mars		222	504	168	62.2	129	98	129
Mercury	222		282	390	159.8	351	320	351
Venus	504	282		672	441.8	633	602	633
Neptune	168	390	672		230.2	39	70	39
Earth	62.2	159.8	441.8	230.2		191.2	160.2	191.2
Uranus	129	351	633	39	191.2		31	0
Jupiter	98	320	602	70	160.2	31		31
Saturn	129	351	633	39	191.2	0	31	

Mental Arithmetic

Adding and Subtracting Positive and Negative Numbers

Show how the Average Temperatures Change with the Different Increases and Decreases in temperature.

Planet	Average Temp. (°c)	Increased by 2° (c)	Decreased by 5° (c)	Increased by 11° (c)	Decreased by 13° (c)
Mars	-55				
Mercury	167				
Venus	449				
Neptune	-223				
Earth	7.2				
Uranus	-184				
Jupiter	-153				

Mental Arithmetic

Adding and Subtracting Positive and Negative Numbers

Show how the Average Temperatures Change with the Different Increases and Decreases in temperature.

Planet	Average Temperature (°c)	Increased by 2° (c)	Decreased by 5° (c)	Increased by 11° (c)	Decreased by 13° (c)
Mars	-55				
Mercury	167				
Venus	449				
Neptune	-223				
Earth	7.2				
Uranus	-184				
Jupiter	-153				

Mental Arithmetic

Adding and Subtracting Positive and Negative Numbers

Show how the Average Temperatures Change with the Different Increases and Decreases in temperature.

Planet	Average Temp. (°c)	Increased by 17° (c)	Decreased by 24° (c)	Increased by 33° (c)	Decreased by 106° (c)
Mars	-55				
Mercury	167				
Venus	449				
Neptune	-223				
Earth	7.2				
Uranus	-184				
Jupiter	-153				

Mental Arithmetic

Adding and Subtracting Positive and Negative Numbers

Show how the Average Temperatures Change with the Different Increases and Decreases in temperature.

Planet	Average Temperature (°c)	Increased by 17° (c)	Decreased by 24° (c)	Increased by 33° (c)	Decreased by 106° (c)
Mars	-55				
Mercury	167				
Venus	449				
Neptune	-223				
Earth	7.2				
Uranus	-184				
Jupiter	-153				

Mental Arithmetic

Adding and Subtracting Positive and Negative Numbers

Calculate the missing temperature (T) for each of the following equations. Don't forget to double check your answers!

Planet	Average Temp. (°C)	Working Out	T (°C)
Mars	$-34 - T = -55$		
Mercury	$-18 + T = 167$		
Venus	$T - 204 = 449$		
Neptune	$T + 119 = -223$		
Earth	$T - 14.7 = 7.2$		
Uranus	$48 + T = -184$		
Jupiter	$-265 - T = -153$		

Mental Arithmetic

Adding and Subtracting Positive and Negative Numbers

Calculate the missing temperature (T) for each of the following equations. Don't forget to double check your answers!

Planet	Average Temp. (°C)	Working Out	T (°C)
Mars	$-34 - T = -55$		
Mercury	$-18 + T = 167$		
Venus	$T - 204 = 449$		
Neptune	$T + 119 = -223$		
Earth	$T - 14.7 = 7.2$		
Uranus	$48 + T = -184$		
Jupiter	$-265 - T = -153$		

Mental Arithmetic Answers

Adding and Subtracting Positive and Negative Numbers

Show how the Average Temperatures Change with the Different Increases and Decreases in temperature.

Planet	Average Temp. (°c)	Increased by 2° (c)	Decreased by 5° (c)	Increased by 11° (c)	Decreased by 13° (c)
Mars	-55	-53	-58	-47	-60
Mercury	167	169	164	175	162
Venus	449	451	446	457	444
Neptune	-223	-221	-226	-215	-236
Earth	7.2	9.2	4.2	15.2	2.2
Uranus	-184	-182	-187	-176	-189
Jupiter	-153	-151	-156	-145	-158

Mental Arithmetic Answers

Adding and Subtracting Positive and Negative Numbers

Show how the Average Temperatures Change with the Different Increases and Decreases in temperature.

Planet	Average Temperature (°c)	Increased by 2° (c)	Decreased by 5° (c)	Increased by 11° (c)	Decreased by 13° (c)
Mars	-55	-53	-58	-47	-60
Mercury	167	169	164	175	162
Venus	449	451	446	457	444
Neptune	-223	-221	-226	-215	-236
Earth	7.2	9.2	4.2	15.2	2.2
Uranus	-184	-182	-187	-176	-189
Jupiter	-153	-151	-156	-145	-158

Mental Arithmetic Answers

Adding and Subtracting Positive and Negative Numbers

Show how the Average Temperatures Change with the Different Increases and Decreases in temperature.

Planet	Average Temp. (°c)	Increased by 17° (c)	Decreased by 24° (c)	Increased by 33° (c)	Decreased by 106° (c)
Mars	-55	-38	-62	-29	-135
Mercury	167	184	160	193	87
Venus	449	466	442	475	369
Neptune	-223	-206	-230	-197	-303
Earth	7.2	24.2	0.2	33.2	-72.8
Uranus	-184	-167	-191	-158	-264
Jupiter	-153	-136	-112	-79	-185

Mental Arithmetic Answers

Adding and Subtracting Positive and Negative Numbers

Show how the Average Temperatures Change with the Different Increases and Decreases in temperature.

Planet	Average Temperature (°c)	Increased by 17° (c)	Decreased by 24° (c)	Increased by 33° (c)	Decreased by 106° (c)
Mars	-55	-38	-62	-29	-135
Mercury	167	184	160	193	87
Venus	449	466	442	475	369
Neptune	-223	-206	-230	-197	-303
Earth	7.2	24.2	0.2	33.2	-72.8
Uranus	-184	-167	-191	-158	-264
Jupiter	-153	-136	-112	-79	-185

Mental Arithmetic Answers

Adding and Subtracting Positive and Negative Numbers

Calculate the missing temperature (T) for each of the following equations. Don't forget to double check your answers!

Planet	Average Temp. (°c)	T (°c)	Double Check
Mars	$-34 - T = -55$	21	$-34 - 21 = -55$
Mercury	$-18 + T = 167$	185	$-18 + 185 = 167$
Venus	$T - 204 = 449$	653	$245 - 204 = 449$
Neptune	$T + 119 = -223$	-342	$-342 + 119 = -223$
Earth	$T - 14.7 = 7.2$	22.9	$22.9 - 14.7 = 7.2$
Uranus	$48 + T = -184$	-232	$48 + (-232) = -184$
Jupiter	$-265 - T = -153$	-103	$-265 - (-103) = -153$

Mental Arithmetic Answers

Adding and Subtracting Positive and Negative Numbers

Calculate the missing temperature (T) for each of the following equations. Don't forget to double check your answers!

Planet	Average Temp. (°c)	T (°c)	Double Check
Mars	$-34 - T = -55$	21	$-34 - 21 = -55$
Mercury	$-18 + T = 167$	185	$-18 + 185 = 167$
Venus	$T - 204 = 449$	653	$653 - 204 = 449$
Neptune	$T + 119 = -223$	-342	$-342 + 119 = -223$
Earth	$T - 14.7 = 7.2$	22.9	$22.9 - 14.7 = 7.2$
Uranus	$48 + T = -184$	-232	$48 + (-232) = -184$
Jupiter	$-265 - T = 153$	-418	$-265 - (-418) = 153$

Ordering Positive and Negative Numbers

Planet	Average Temperature (°C)
Mars	-55
Mercury	167
Venus	449
Neptune	-223
Earth	7.2
Uranus	-184
Jupiter	-153
Saturn	-184

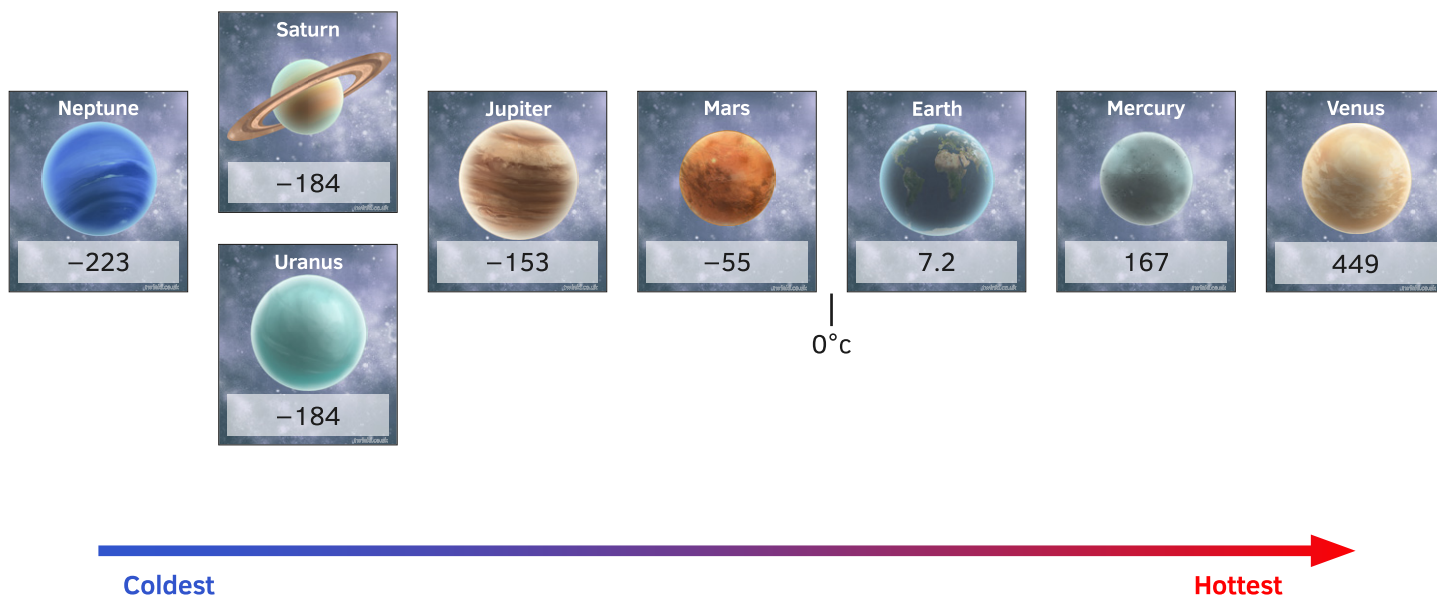
Why not **order** the numbers using your Planet Cards?

Ordering Positive and Negative Numbers

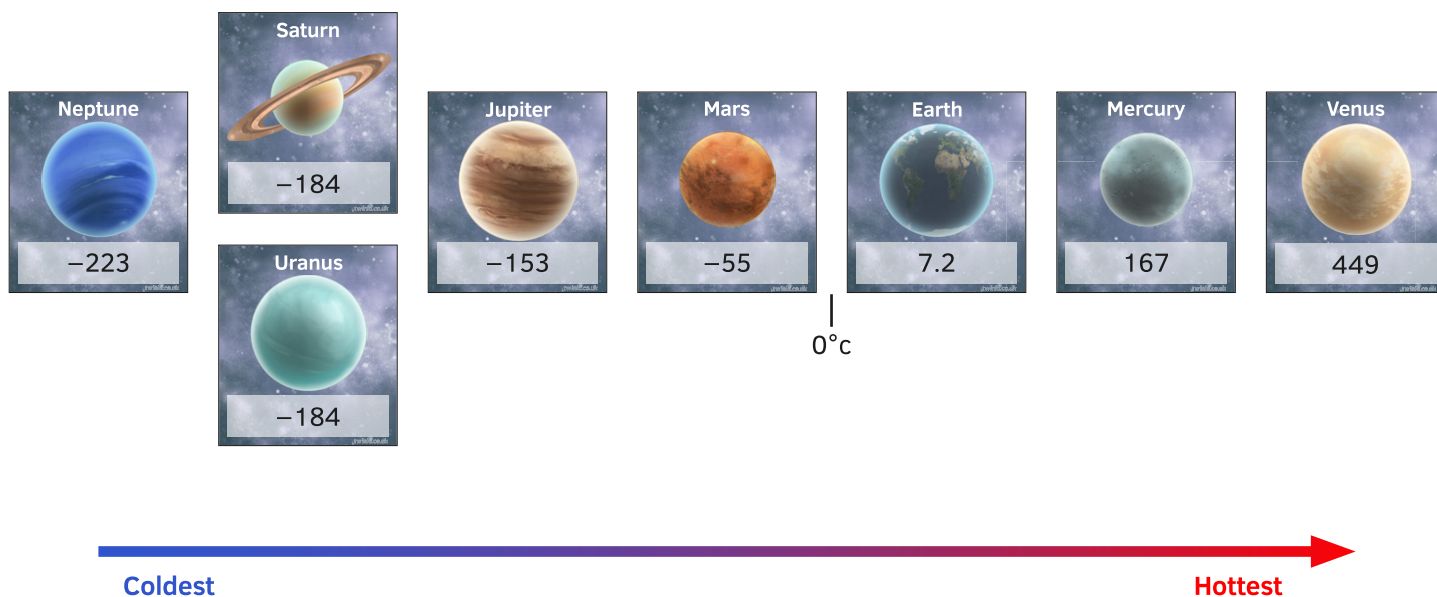
Planet	Average Temperature (°C)
Mars	-55
Mercury	167
Venus	449
Neptune	-223
Earth	7.2
Uranus	-184
Jupiter	-153
Saturn	-184

Why not **order** the numbers using your Planet Cards?

Ordering Positive and Negative Numbers Answers

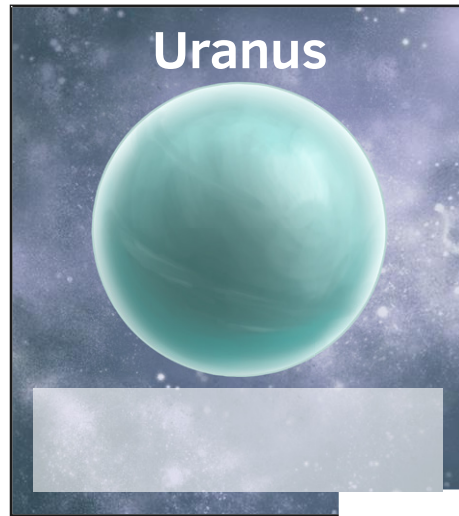
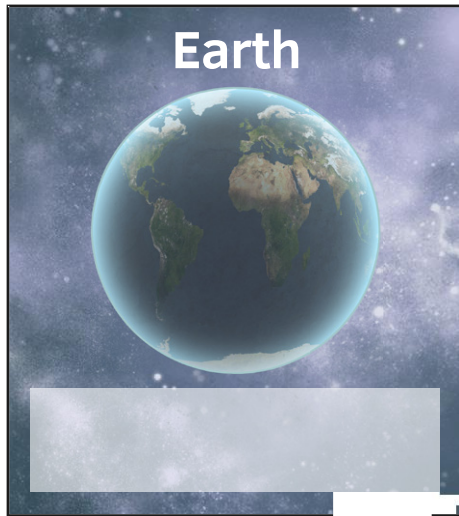
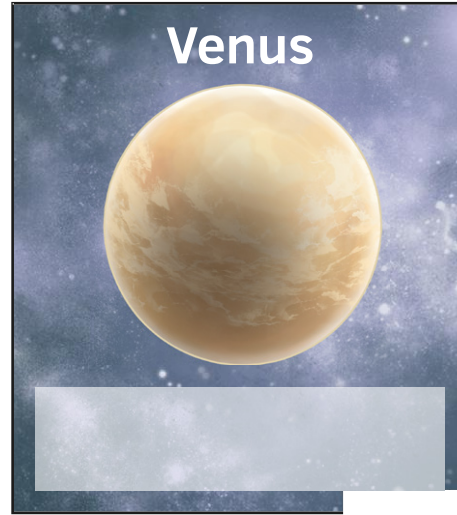
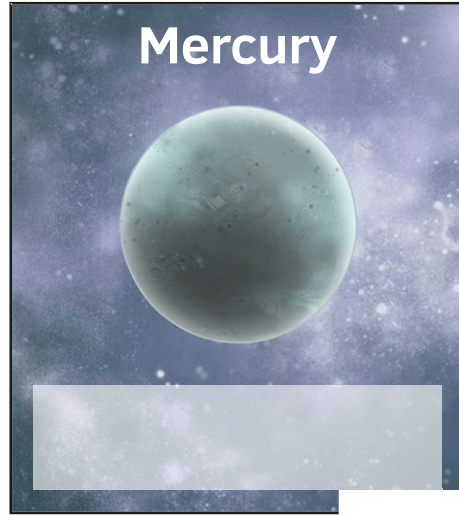
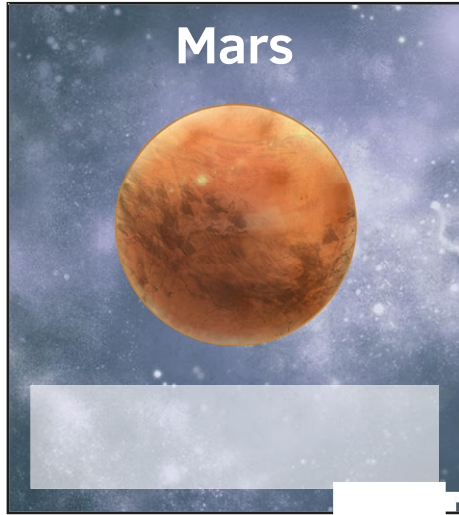


Ordering Positive and Negative Numbers Answers



Planet Cards

Why not cut out and use as ordering templates or answer cards?
Laminate and they are wipeable and reusable!



Planet Data Table

Planet	Distance from Sun (km)	Average Temperature (°c)	Diameter (km)	Duration of 1 Rotation
Mars	227 940 000	-55	6 794	24 hours 37 minutes
Mercury	57 910 000	167	4 876	59 days
Venus	108 200 000	449	12 107	243 days
Neptune	4 501 000 000	-223	49 527	16 hours 17 minutes
Earth	149 600 000	7.2	12 775	23 hours 56 minutes
Uranus	2 873 550 000	-184	51 117	17 hours 12 minutes
Jupiter	778 330 000	-153	142 983	9 hours 55 minutes
Saturn	1 424 600 000	-184	120 536	10 hours 13 minutes

Rounding

Planet	Diameter (km)	Rounding to the nearest 10	Rounding to the nearest 100	Rounding to the nearest 1 000
Mars	6 794			
Mercury	4 876			
Venus	12 107			
Neptune	49 527			
Earth	12 755			
Uranus	51 117			
Jupiter	142 983			
Saturn	120 536			

Rounding

Planet	Diameter (km)	Rounding to the nearest 10	Rounding to the nearest 100	Rounding to the nearest 1 000
Mars	6 794			
Mercury	4 876			
Venus	12 107			
Neptune	49 527			
Earth	12 755			
Uranus	51 117			
Jupiter	142 983			
Saturn	120 536			

Rounding

Planet	Diameter (km)	Rounding to the nearest 10 000
Mars	6 794	
Mercury	4 876	
Venus	12 107	
Neptune	49 527	
Earth	12 755	
Uranus	51 117	
Jupiter	142 983	
Saturn	120 536	

Rounding

Planet	Diameter (km)	Rounding to the nearest 10 000
Mars	6 794	
Mercury	4 876	
Venus	12 107	
Neptune	49 527	
Earth	12 755	
Uranus	51 117	
Jupiter	142 983	
Saturn	120 536	

Rounding

Planet	Distance from the Sun (km)	Rounding to the nearest 1 000 000
Mars	227 940 000	
Mercury	57 910 000	
Venus	108 200 000	
Neptune	4 501 000 000	
Earth	149 600 000	
Uranus	2 873 550 000	
Jupiter	778 330 000	
Saturn	1 424 600 000	

Rounding

Planet	Distance from the Sun (km)	Rounding to the nearest 1 000 000
Mars	227 940 000	
Mercury	57 910 000	
Venus	108 200 000	
Neptune	4 501 000 000	
Earth	149 600 000	
Uranus	2 873 550 000	
Jupiter	778 330 000	
Saturn	1 424 600 000	

Rounding Answers

Planet	Diameter (km)	Rounding to the nearest 10	Rounding to the nearest 100	Rounding to the nearest 1 000
Mars	6 794	6 790	6 700	7 000
Mercury	4 876	4 880	4 900	5 000
Venus	12 107	12 110	12 110	12 000
Neptune	49 527	49 530	49 500	50 000
Earth	12 755	12 760	12 800	13 000
Uranus	51 117	51 120	51 100	51 000
Jupiter	142 983	142 980	143 000	143 000
Saturn	120 536	120 540	120 500	121 000

Rounding Answers

Planet	Diameter (km)	Rounding to the nearest 10 000
Mars	6 794	10 000
Mercury	4 876	0
Venus	12 107	10 000
Neptune	49 527	50 000
Earth	12 755	10 000
Uranus	51 117	50 000
Jupiter	142 983	140 000
Saturn	120 536	120 000

Planet	Distance from Sun (km)	Rounding to the nearest 1 000 000
Mars	6 794	228 000 000
Mercury	4 876	58 000 000
Venus	12 107	108 000 000
Neptune	49 527	4 501 000 000
Earth	12 755	150 000 000
Uranus	51 117	2 874 000 000
Jupiter	142 983	778 000 000
Saturn	120 536	1 425 000 000

Standard Form

Planet	Distance from Sun (km)	Distance from Sun - Standard form (km)
Mars	227 940 000	
Mercury	57 910 000	
Venus	108 200 000	
Neptune	4 501 000 000	
Earth	149 600 000	
Uranus	2 873 550 000	
Jupiter	778 330 000	
Saturn	1 424 600 000	

Standard Form

Planet	Distance from Sun (km)	Distance from Sun - Standard form (km)
Mars	227 940 000	
Mercury	57 910 000	
Venus	108 200 000	
Neptune	4 501 000 000	
Earth	149 600 000	
Uranus	2 873 550 000	
Jupiter	778 330 000	
Saturn	1 424 600 000	

Standard Form Answers

Planet	Distance from Sun (km)	Distance from Sun - Standard form (km)
Mars	227 940 000	2.2794×10^8
Mercury	57 910 000	5.791×10^7
Venus	108 200 000	1.082×10^8
Neptune	4 501 000 000	4.501×10^9
Earth	149 600 000	1.496×10^8
Uranus	2 873 550 000	2.87355×10^9
Jupiter	778 330 000	7.7833×10^8
Saturn	1 424 600 000	1.4246×10^9

Standard Form Answers

Planet	Distance from Sun (km)	Distance from Sun - Standard form (km)
Mars	227 940 000	2.2794×10^8
Mercury	57 910 000	5.791×10^7
Venus	108 200 000	1.082×10^8
Neptune	4 501 000 000	4.501×10^9
Earth	149 600 000	1.496×10^8
Uranus	2 873 550 000	2.87355×10^9
Jupiter	778 330 000	7.7833×10^8
Saturn	1 424 600 000	1.4246×10^9

Writing Whole Numbers

Why not **order** the numbers using your Planet Cards?

Planet	Diameter in Words (km)	Diameter in Numbers (km)
Mercury	Four thousand, eight hundred and seventy-six kilometres	
Saturn	One hundred and twenty thousand, five hundred and thirty-six kilometres	
Venus	Twelve thousand, one hundred and seven kilometres	
Jupiter	One hundred and forty two thousand, nine hundred and eighty-three kilometres	
Neptune	Forty nine thousand, five hundred and twenty-seven kilometres	
Earth	Twelve thousand, seven hundred and fifty-five kilometres	
Mars	Six thousand, seven hundred and ninety-four kilometres	
Uranus	Fifty one thousand, one hundred and seventeen kilometres	

Writing Whole Numbers

Why not **order** the numbers using your Planet Cards?

Planet	Distance from the Sun in Words (km)	Distance from the Sun in Numbers (km)
Mercury	Fifty seven million, nine hundred and ten thousand kilometres	
Saturn	One billion, four hundred and twenty four million, six hundred thousand kilometres	
Venus	One hundred and eight million, two hundred thousand kilometres	
Jupiter	Seven hundred and seventy eight million, three hundred and thirty thousand kilometres	
Neptune	Four billion, five hundred and one million kilometres	
Earth	One hundred and forty nine million, six hundred thousand kilometres	
Mars	Two hundred and twenty seven million, nine hundred and forty thousand kilometres	
Uranus	Two hundred and eighty seven million, nine hundred and seventy thousand kilometres	