Reasoning and Problem Solving – Months and Years

National Curriculum Objectives:

Mathematics Year 3: (3M4e) Know the number of seconds in a minute and the number of days in each month, year and leap year

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Decide which of three statements are always true, sometimes true or never true. Involves the number of days and months in a year and leap year and the number of days in each month.
Expected Decide whether four statements are always true, sometimes true or never true. Involves the number of days and months in a year and leap year and the number of days in each month.
Greater Depth Decide whether four statements are always true, sometimes true or never true. Involves the number of days and months in multiple years and leap years and the number of days in months.

Questions 2, 5 and 8 (Reasoning)
Developing Decide which of three options is the odd one out. Explain why. Involves the number of days in months.
Expected Decide which of three options is the odd one out. Explain why. Involves the number of days in months and the order of the months. Different formats used.
Greater Depth Decide which of three options could be the odd one out. Involves the number of days in multiple months and the order of the months. Different formats used.

Questions 3, 6 and 9 (Problem Solving)
Developing Complete 4 pieces of missing information about dates of birth. Information presented in the order it should be used.
Expected Complete 5 pieces of missing information about dates of birth.
Greater Depth Complete 5 pieces of missing information about dates of birth. Involves leap years and some addition and subtraction.

More Year 3 Time resources.

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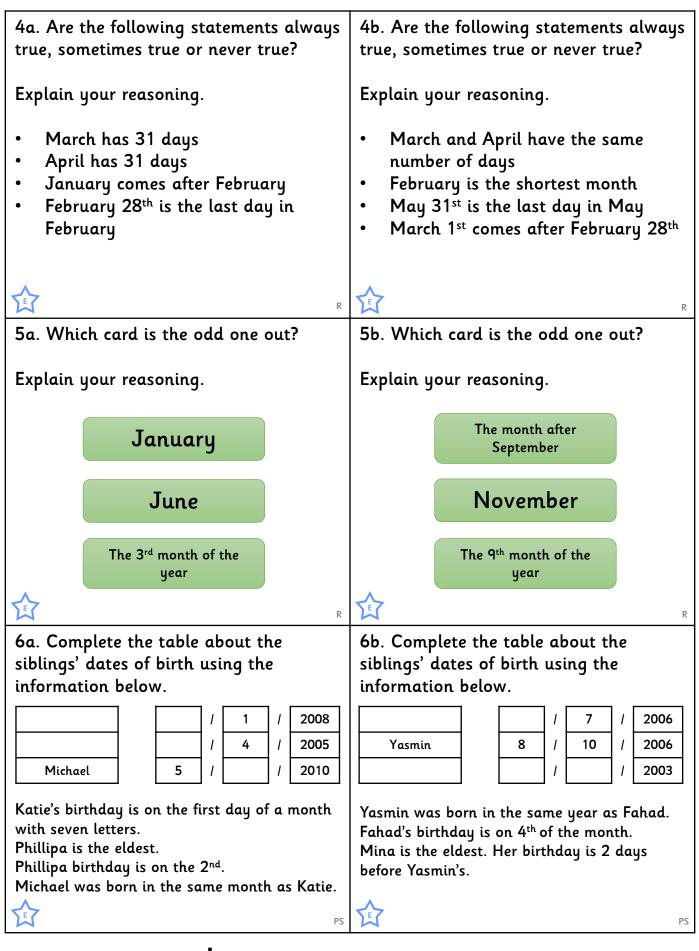
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Reasoning and Problem Solving – Months and Years

1a. Decide which statement is always true, sometimes true or never true.

Explain your reasoning.

- There are 12 months in a year
- May is longer than August
- February has 28 days

D · R

1b. Decide which statement is always true, sometimes true or never true.

Explain your reasoning.

- December is the 12th month of the year
- September has 31 days
- A year has 365 days

D · R

2a. Which card is the odd one out?

Explain your reasoning.

October

November

January

D · R

2b. Which card is the odd one out?

Explain your reasoning.

365 days

A leap year

A non-leap year

D · R

3a. Complete the table about the siblings' dates of birth using the information below.

Carla		30	/		/	2001
		11	/	5	/	2007
Georgi			/		/	2003

Georgi's birthday is 12th May.
Ishmael's birthday is the day before Georgi's.
Carla's birthday is in November.

D · PS

3b. Complete the table about the friends' dates of birth using the information below.

Neale		30	/	4	/	2008
Kai		3	/	6	/	2001
Nour		30	/	1	/	2008

Neale's birthday is on the last day of the month.
Kai's birthday is on the third day of June.
Nour was born in the same year as Neale.

D · PS

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Reasoning and Problem Solving – Months and Years

4a. Are the following statements always true, sometimes true or never true?

Explain your reasoning.

- March has 31 days
- April has 31 days
- January comes after February
- February 28th is the last day in February

4b. Are the following statements always true, sometimes true or never true?

Explain your reasoning.

- March and April have the same number of days
- February is the shortest month
- May 31st is the last day in May
- March 1st comes after February 28th

5a. Which card is the odd one out?

Explain your reasoning.

> January

> June

> The 3rd month of the year

5b. Which card is the odd one out?

Explain your reasoning.

> The month after September

> November

> The 9th month of the year

6a. Complete the table about the siblings' dates of birth using the information below.

		/	1	/	2008
		/	4	/	2005
Michael	5	/		/	2010

Katie's birthday is on the first day of a month with seven letters.
Phillipa is the eldest.
Phillipa birthday is on the 2nd.
Michael was born in the same month as Katie.

6b. Complete the table about the siblings' dates of birth using the information below.

		/	7	/	2006
Yasmin	8	/	10	/	2006
		/		/	2003

Yasmin was born in the same year as Fahad. Fahad's birthday is on 4th of the month.
Mina is the eldest. Her birthday is 2 days before Yasmin's.

Reasoning and Problem Solving – Months and Years

7a. Are the following statements always true, sometimes true or never true?

Explain your reasoning.

- There are 28 days between 01/02 and 01/03
- There are 366 days in 2020
- There are 90 days in 3 consecutive months
- The day before September 1st is August 31st

GD · R

7b. Are the following statements always true, sometimes true or never true?

Explain your reasoning.

- There are 732 days in 2 consecutive years
- A week after February 25th will be March 4th
- There are 60 months in 5 years.
- A leap year comes before a non-leap year

GD · R

8a. Which card is the odd one out?

Explain your reasoning.

> **61 days**

> The 9th and 10th months of the year

> **July and August**

GD · R

8b. Which card is the odd one out?

Explain your reasoning.

> **The year 2016**

> **365 days**

> **The year 2015**

GD · R

9a. Complete the table about the siblings' dates of birth using the information below.

		12	/	3	/	2001
Sarah			/		/	2009
		4	/		/	2008

Sarah birthday is 9 days before Jilani's.
Jilani was born in a leap year.
Jilani's birthday is in the month before Kyle's.
Kyle is the eldest.

GD · PS

9b. Complete the table about the siblings' dates of birth using the information below.

Mateo		30	/		/	1999
			/		/	2012
Cara			/	2	/	2008

Mateo's birthday is in the fourth month of the year.
Harry's birthday is 2 weeks after Mateo's.
Cara's birthday is on the last day of the month in a leap year.
Harry is the youngest.

GD · PS

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Reasoning and Problem Solving – Months and Years

<u>Developing</u>

1a. There are 12 months in a year – Always true

May is longer than August – Never true because May and August both have 31 days

February has 28 days – Sometimes true because in a leap year February has 29 days, but in a non-leap year it has 28 days.
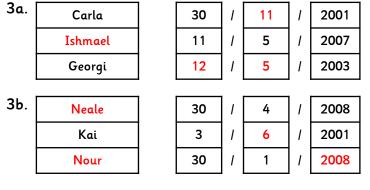
1b. December is the 12th month of the year – Always true

September has 31 days – Never true because September has 30 days

A year has 365 days – Sometimes true because a leap year has 366 days and a non-leap year has 365 days.

2a. November is the odd one out because it has 30 days whereas October and January have 31 days.

2b. A leap year is the odd one out because it has 366 days. A non-leap year has 365 days.

3a.

Carla		30	/	11	/	2001
Ishmael		11	/	5	/	2007
Georgi		12	/	5	/	2003

3b.

Neale		30	/	4	/	2008
Kai		3	/	6	/	2001
Nour		30	/	1	/	2008

<u>Expected</u>

4a. March has 31 days – Always true because March always has 31 days.

April has 31 days – Never true because April has 30 days

January comes after February – Never true because January comes before February

February 28th is the last day in February – Sometimes true because February has 28 days in a non-leap year and 29 days in a leap year.

4b. March and April have the same number of days – Never true because March has 31 days and April has 30 days

February is the shortest month – Always true because February has 28 or 29 days and the other months have either 30 or 31 days
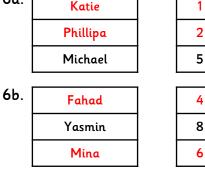
May 31st is the last day in May – Always true because May always has 31 days
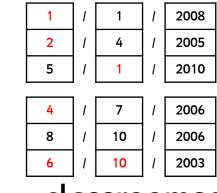
March 1st comes after February 28th – Sometimes true because in a leap year, February has 29 days so February 29th comes after February 28th.

5a. June is the odd one out because June has 30 days. The third month of the year is March which has 31 days and January also has 31 days.

5b. The month after September is the odd one out because it is October which has 31 days. The 9th month of the year is September which has 30 days and November also has 30 days.

6a.

Katie		1	/	1	/	2008
Phillipa		2	/	4	/	2005
Michael		5	/	1	/	2010

6b.

Fahad		4	/	7	/	2006
Yasmin		8	/	10	/	2006
Mina		6	/	10	/	2003

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Reasoning and Problem Solving – Months and Years ANSWERS

Reasoning and Problem Solving – Months and Years

7a. There are 28 days between 01/02 and 01/03 – Sometimes true because February has 28 days in a leap year and 29 years in a non-leap year.

There are 366 days in 2020 – Always true because 2020 will be a leap year and leap years have 366 days.
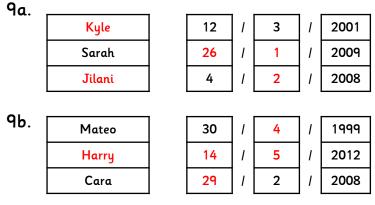
There are 90 days in 3 consecutive months – Sometimes true because the shortest three consecutive months are Feburary, March, April which have 29 (in a leap year), 31 and 30 days and which is a total of 90 days. Other consecutive months will have more than 90 days such as March, April, May has 92 days.

The day before September 1st is August 31st – Always true because August has 31 days.

7b. There are 732 days in 2 consecutive years – Never true because leap years are four years apart so cannot be consecutive. 2 consecutive years will have either 730 days (2 non-leap years) or 731 days (1 leap year and 1 non-leap year).

A week after February 25th will be March 4th – Sometimes true because in a non-leap year, February has 28 days so this will be true but in a leap year February has 29 days so a week after February 25th would be March 3th.

There are 60 months in 5 years – Always true because a year has 12 months and 12 x 5 = 60.

A leap year comes before a non-leap year – Sometimes true because leap years happen every 4 years so sometimes a leap year will come before a non-leap year but sometimes a non-leap year will come before a non-leap year.

8a. July and August is the odd one out because they have 31 days each so 62 days in total. The 9th and 10th months are September and October which have 30 and 31 days so 61 days in total.

8b. The year 2016 is the odd one out because it is a leap year so has 366 days. The year 2015 is a non-leap year so has 365 days.

9a.

Name	D		M		Y
Kyle	12	/	3	/	2001
Sarah	26	/	1	/	2009
Jilani	4	/	2	/	2008

9b.

Name	D		M		Y
Mateo	30	/	4	/	1999
Harry	14	/	5	/	2012
Cara	29	/	2	/	2008