

# Tour de Maths 2019 - Transition Week



106<sup>th</sup> EDITION  
6-28 JULY 2019

100 YEARS  
OF THE YELLOW JERSEY

### LÉGENDE / THE KEY

- Grand Départ (Race Start)
- Ville départ (Start town)
- Ville arrivée (Finish town)
- Ville relais (Rest town)
- Arrivée finale (Race finish)
- Étape en ligne (Stage)
- C.Lim. Individuel (Individual time trial)
- C.Lim. par équipes (Team time trial)

letour.fr @LeTour #TDF2019



Name: \_\_\_\_\_

Form: \_\_\_\_\_

## Task 1 - Introduction to the 'Tour de France'

- Do you know what the 'Tour de France' is?  
Discuss with a partner
- 

You will now watch a video which gives you a good idea of what is involved in this annual event.

Link: [Lesson 1.mp4](#)

Now answer the following questions:

- Who won the 2018 Tour de France? \_\_\_\_\_
- What was his Nationality? \_\_\_\_\_
- What colour jersey does the rider with the overall fastest time wear? \_\_\_\_\_

Now look at the front cover and answer the following questions:

- How many Tour de France competitions have been held since the competition was first introduced in 1903? \_\_\_\_\_
- Can you think of any reasons why there were some years when the race didn't take place?  
\_\_\_\_\_  
\_\_\_\_\_

The opposite page shows a variety of data from the last 100+ years of the Tour de France:

## Work sheet Routes



**1903** – 6 Stages  
– 51 Days  
2,428 km raced  
at an average  
speed of  
25.68 km/hr.



**1925** – 18 stages -  
29 days,  
5430km raced at  
an average speed  
of 24,775km/hr

**1949** – 21 Stages  
– 25 Days  
4,808km raced at  
an average speed  
of 32.121 km/hr.



**1970** – 23 Stages – 24 Days  
4,254km raced at an average  
speed of 35.589 km/hr.

**2012** – 21 Stages – 23 Days  
3,488km raced at an average  
speed of 39.83 km/hr.
























The 2019 Tour de France departs from Brussels, Belgium's capital city, on Saturday 6<sup>th</sup> July and finishes in Paris the capital of France on Sunday 28<sup>th</sup> July.

There are 21 stages to the race which are displayed on the next page.

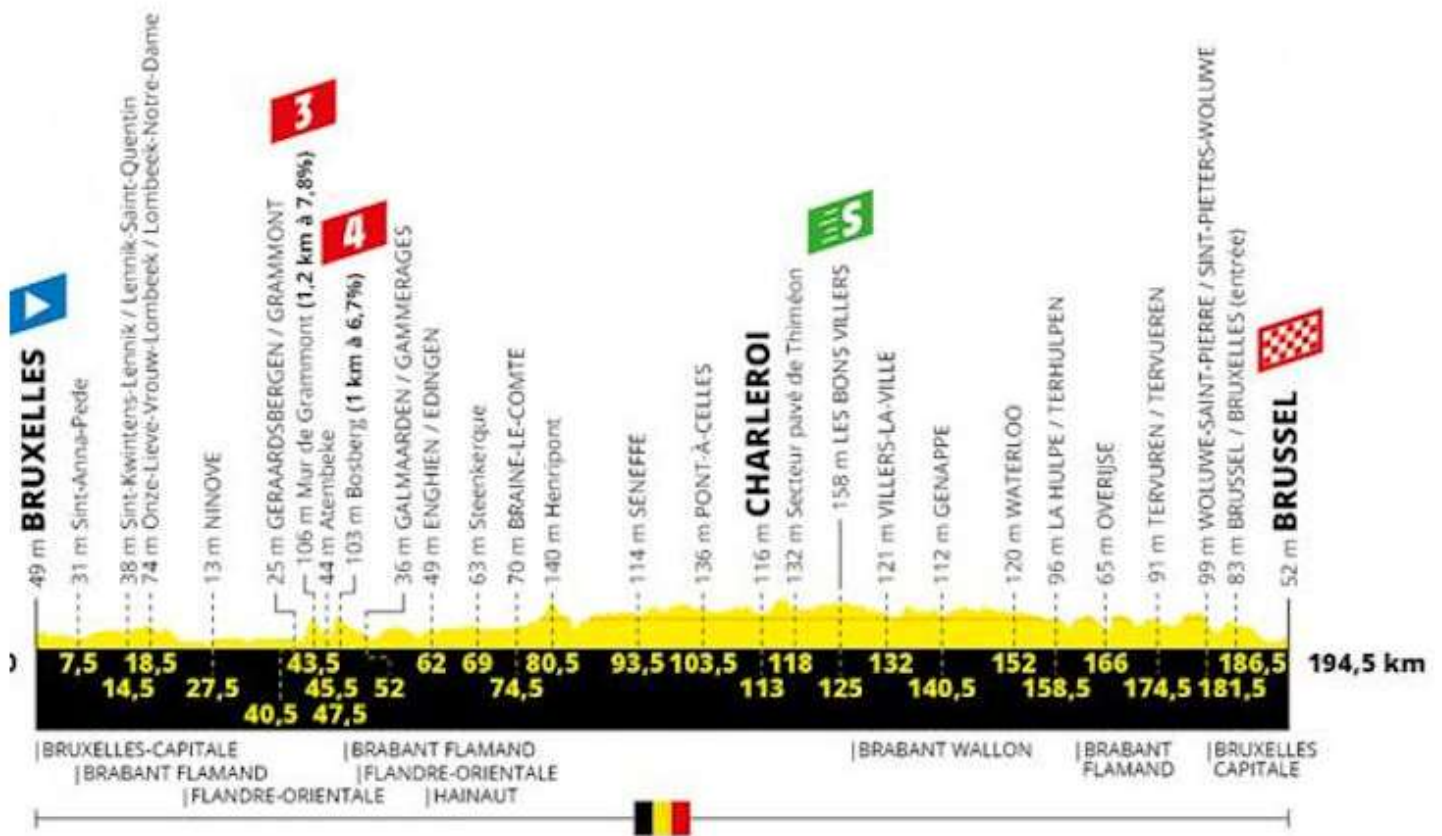
Answer the questions below after skimming through this information.

### Stages of the Tour de France

- 1) Which stage of the race starts in Toulouse? \_\_\_\_\_
- 2) Which stage of the race ends in Valloire? \_\_\_\_\_
- 3) Which is the shortest stage in the race and how long is it?  
\_\_\_\_\_
- 4) On what day does the race end and where?  
\_\_\_\_\_
- 5) What fraction of the **days** are rest days? = \_\_\_\_\_
- 6) What fraction of the **stages** are flat? = \_\_\_\_\_
- 7) Estimate the percentage of the **stages** that are hilly = \_\_\_\_\_
- 8) What fraction of the **stages** are mountainous - write your answer in simplest form = \_\_\_\_\_

STAGE	TYPE	DATE	START AND FINISH	DISTANCE
1	 Flat	Saturday, July 6, 2019	Bruxelles > Brussel	194.5 km
2	 Team Time-Trial	Sunday, July 7, 2019	Bruxelles Palais Royal > Brussel Atomium	27.6 km
3	 Hilly	Monday, July 8, 2019	Binche > Épernay	215 km
4	 Flat	Tuesday, July 9, 2019	Reims > Nancy	213.5 km
5	 Hilly	Wednesday, July 10, 2019	Saint-Dié-des-Vosges > Colmar	175.5 km
6	 Mountain	Thursday, July 11, 2019	Mulhouse > La Planche des Belles Filles	160.5 km
7	 Flat	Friday, July 12, 2019	Belfort > Chalon-sur-Saône	230 km
8	 Hilly	Saturday, July 13, 2019	Mâcon > Saint-Étienne	200 km
9	 Hilly	Sunday, July 14, 2019	Saint-Étienne > Brioude	170.5 km
10	 Flat	Monday, July 15, 2019	Saint-Flour > Albi	217.5 km
-	Rest Day	Tuesday, July 16, 2019	Albi	
11	 Flat	Wednesday, July 17, 2019	Albi > Toulouse	167 km
12	 Mountain	Thursday, July 18, 2019	Toulouse > Bagnères-de-Bigorre	209.5 km
13	 Individual time-trial	Friday, July 19, 2019	Pau > Pau	27.2 km
14	 Mountain	Saturday, July 20, 2019	Tarbes > Tourmalet Barèges	117.5 km
15	 Mountain	Sunday, July 21, 2019	Limoux > Foix Prat d'Albis	185 km
-	Rest Day	Monday, July 22, 2019	Nîmes	
16	 Flat	Tuesday, July 23, 2019	Nîmes > Nîmes	177 km
17	 Hilly	Wednesday, July 24, 2019	Pont du Gard > Gap	200 km
18	 Mountain	Thursday, July 25, 2019	Embrun > Valloire	208 km
19	 Mountain	Friday, July 26, 2019	Saint-Jean-de-Maurienne > Tignes	126.5 km
20	 Mountain	Saturday, July 27, 2019	Albertville > Val Thorens	130 km
21	 Flat	Sunday, July 28, 2019	Rambouillet > Paris Champs-Élysées	128 km

## Tour de France 2019 Profile 1st stage: Brussels - Brussels



Note that in France they use a comma , instead of a decimal point . so 140.5 km would be written as 140,5 km.

Look at the height profile of the route for the first stage of the 2019 competition and then answer the following questions.

- 1) How many km was the first stage of the competition? \_\_\_\_\_
- 2) After how many km did the riders arrive at Charleroi? \_\_\_\_\_
- 3) After how many km did the riders reach the highest point of the stage 1 route and what was the place called? \_\_\_\_\_
- 4) What was the range of the hill heights? \_\_\_\_\_

In your next maths lesson, the task will involve you designing a bike that will give you a good chance of winning the 2019 'Tour de France'. Now you will watch a video which shows a bike similar to those used in the 'Tour de France' competitions to help you make some informed choices next lesson.

Link: [Lesson 2.mp4](#)

Below are two pictures of bikes exactly one hundred years apart in age!



This first picture shows the bike that the French cyclist Maurice Garin rode to victory in the first ever Tour de France.

The second picture shows the first British winner of the Tour de France (2012), Bradley Wiggins during the 2013 competition.



What do you notice about the design of the bikes when you compare the two photos? Why do you think these changes occurred?

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Look at the following pictures of bikes from the last 100 years. Can you work out which bike belongs to which decade and match the letter to the year(s) listed?

**Work sheet** History Bikes



Steel frame  
One Gear – fixed wheel  
No Brakes

**A**



Steel frame  
One Gear – fixed wheel  
Brakes – Wooden wheel rims  
Drop Handlebars

**D**



Steel frame  
10 Gears  
Steel Wheel Rims

**B**



Steel frame  
10 Gears  
Aluminium wheel rims

**E**



Carbon Fibre Frame  
22 Electronic Gears  
Carbon Fibre Wheels

**C**

Match the bikes to the decade:

1903 .....

1920's .....

1940's .....

1960/70's .....

2012 .....



## Task 2 - Build a Bike Challenge

Imagine you are a rider in the 2019 Tour de France and are due to take part in the Grand Départ this weekend. You need a bike and have been given a budget of £4000. Your task is to choose parts that will create the best bike for the race.

### Section A - The Green Jersey (leader of the points classification)

You have to choose four different items for your bike, one from each of the following categories:

- Frame
- Seat
- Wheels and Tyres
- Chain and Chain set



You must decide which item will be the best from each category - you are looking for something that will be strong, long-lasting and help you go faster!

To help you choose from each of the categories listed on the next four pages, rewatch the video which shows you a bike similar to those used in the 'Tour de France':

Link: [Lesson 2.mp4](#)






## Cyclopedia Bike Shop - Frames

Material	Cost	Weight	Durability	Strength	Stiffness
Steel 	£2000	Heavy	Short-lasting	High	Low
Aluminium 	£3000	Medium	Medium	Medium	High
Titanium 	£3500	Light	Long-lasting	High	Low
Carbon Fibre 	£4000	Light	Long-lasting	Medium	Medium
Bamboo 	£3000	Medium	Medium	Medium	Medium


## Cyclopedia Bike Shop - Seats

Seat	Price	Comfort	Weight
a 	£50	Super-comfortable	Medium
b 	£100	Hard	Light
c 	£80	Medium	Medium
d 	£30	Soft	Heavy

## Cyclopedia Bike Shop - Wheels and Tyres

Wheel & Tyre	Price (for 2 wheels and 2 tyres)	Weight	Strength	Durability
a 	£500	Medium	High	Medium
b 	£300	Heavy	Medium	Medium
c 	£1000	Light	High	Long-lasting
d 	£200	Heavy	Medium	Short-lasting
e 	£800	Light	High	Medium

## Cyclopedia Bike Shop - Chains and Chain sets

Chain and Chain set	Price	Weight	Strength	Durability
a 	£100	Heavy	High	Medium
b 	£200	Medium	Medium	Long-lasting
c 	£300	Light	High	Short-lasting

Using the price lists, show some workings out here:

Write down the combination of parts you have chosen for your bike here with a reason why you have chosen each part.

Frame:

Seat:

Wheels and Tyres:

Chain and Chain set:

Extension:

If money was not a limiting factor, how much would you need to buy the best bike possible?

Use this box to show your working and the combination of parts.

Why is this the best bike possible?

Section B - The King of the Mountains (Polka Dot) Jersey (best climber of the tour)



Congratulations! You have won a stage of the Tour De France and £1000 in prize money.

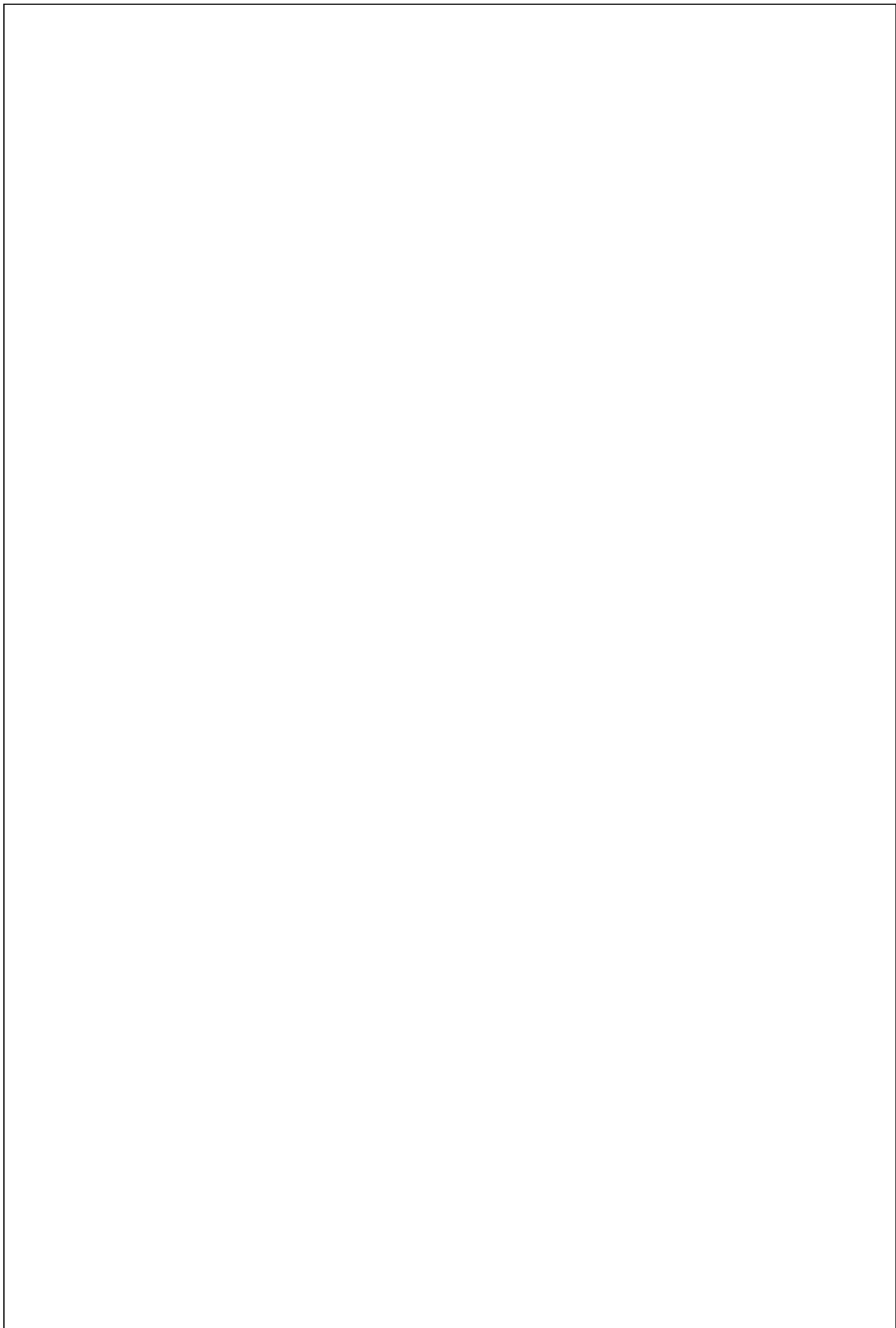
The Cyclopedia bike shop where you bought your bike want to give you 35% off everything in their shop!

However, during the race your **tyres** got very worn down so you will definitely have to replace them.

Build a new bike - spend your winnings, use your discount, replace your worn parts and keep any of your old parts if you want to.

Use this box and the one on the next page to show your workings out and the combination of parts you will use to build your new bike.





Section C - The White Jersey (best young rider, 25 years or younger, with lowest overall time)



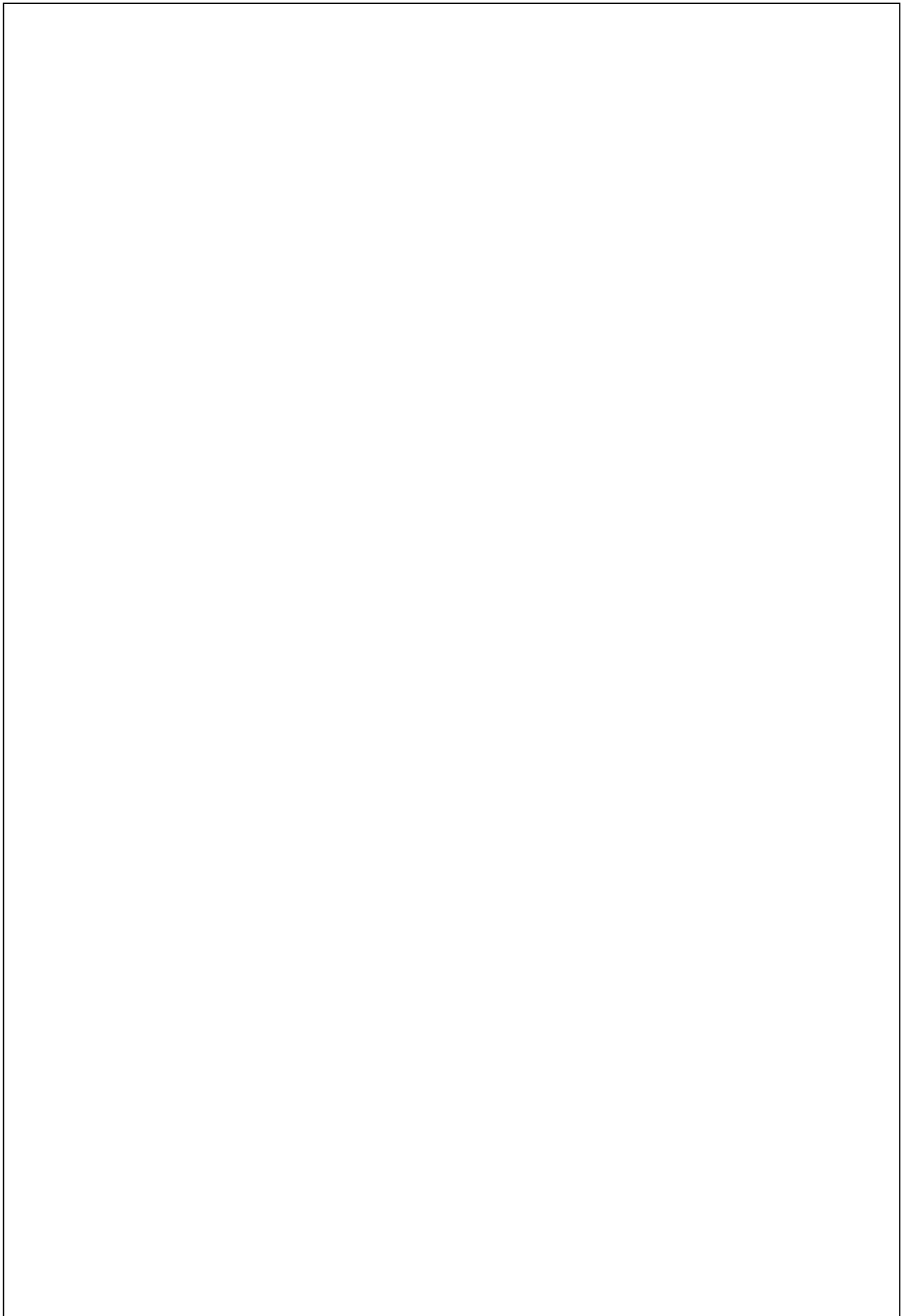
You are race leader now - you've won both stages of the Grand Départ and have got the coveted white jersey!

Your next challenge is to work out the **average cost of a bike from the bike shop.**

Which average will you use to do this calculation? \_\_\_\_\_

Hint: First find the average price for each of the 4 bike parts.

Use the rest of this page and the next to do your workings out.



## Task 3 - Tour de France Maths Puzzle

Work out the answers to the maths questions by searching for the correct clues and using addition, subtraction, multiplication and division skills. Find the numerical answers vertically on the grid and using yellow or green pencils to colour in the squares to create a picture of a Tour de France jersey.

### Work sheet

### Tour de France number search

The youngest ever winner was Henri Cornet aged 19

The oldest ever winner was Lambot aged 36

Eddy Mercx has won the most amount of stages with 34

There are normally 20 teams that take part

The race lasts for 3 weeks (21 days)

The first Tour was held in 1903

Each team has 9 riders

The tallest ever rider was Johan van Summeren at 198cm tall

The highest average speed for a stage was 41 km/h

During the race there are 2 rest days when they do not ride

Each rider burns on average 6000 calories per day whilst riding

The average total length of the race is 3600km

2	1	8	4	7	9	6	4	4	2	6	0	5	1
9	6	3	5	6	2	7	8	5	2	3	2	4	0
6	5	3	1	2	4	7	2	5	3	1	9	7	9
7	4	1	2	3	0	2	7	2	4	9	6	6	9
1	8	9	0	8	0	0	3	1	2	3	0	5	1
0	2	0	0	1	1	0	5	1	3	7	0	1	3
9	8	3	4	7	8	3	6	8	9	6	0	5	9
4	5	2	5	9	0	0	6	8	2	1	2	3	7
7	8	9	6	1	4	0	1	3	0	0	9	4	1
6	2	7	3	9	2	4	2	7	0	9	4	7	6
5	9	4	1	8	0	3	3	0	0	4	8	1	9
6	2	9	0	2	7	1	2	1	9	3	3	6	6

## Work sheet Tour de France number search

Find the answers to these questions in the Numbersearch.  
All answers read downwards (vertically). Colour in the answer squares when you find them. The first one has been done for you.

**Example:** The height in centimetres of the tallest ever rider (198)

1. Number of calories burnt per rider per day
2. Year the first Tour was held
3. The age of the oldest ever winner + age of the youngest ever winner
4. Number of riders in each team x number of weeks the race lasts
5. Number of teams that take part x number of days the race lasts
6. Height of tallest rider – age of youngest winner
7. Highest average speed – number of teams that take part
8. Number of Eddy Mercx stage wins + number of riders in each team
9. Year the first Tour was held – number of teams that take part
10. Number of calories burnt per day – average total length of race
11. Height of tallest rider + highest average speed
12. Eddy Mercx's number of stage wins + Year the Tour was first held
13. Average length of race x number of rest days
14. Age of youngest winner x number of rest days
15. Height of tallest rider + age of oldest rider
16. Number of calories burnt  $\div$  race length in weeks
17. Average total length of race – stages that Eddy Mercx has won
18. Youngest ever riders age + number of riders per team
19. Race length in weeks x highest average speed
20. Highest average speed + length of race in days
21. Number of calories burnt  $\div$  number of teams that take part
22. Age of oldest rider – number of days the race lasts for
23. Number of riders per team x number of teams that take part
24. Average length of race  $\div$  number of weeks race lasts for
25. Number of Eddy Mercx stage wins + age of oldest winner

Use the space below and on the next page for any workings out you want to do:

A large, empty rectangular box with a thin black border, occupying most of the page below the text. It is intended for students to write their working out for a problem.

