

Maths Reasoning Morning  
Wednesday 23<sup>rd</sup> June  
Estimating

In Physics, the three fundamental quantities are mass, time and length. All children will encounter these (and many other quantities), and learn how scientists measure them accurately, when they embark on their KS3 Science and Mathematics curricula.

I planned and prepared seven activities...three relating to mass, three relating to time and one relating to length/distance...so that I could easily divide Shepherds Class into seven carefully-selected groups of four.

The overall aim was to estimate and/or measure everyday masses, times and lengths/distances. I also wanted to assess the children's ability to work with others (an important transferrable skill that is reinforced and developed further in secondary schools).

The activities were planned to last for about ten minutes each, after which, the groups would rotate.

From the example group Answer Sheet, below, each of the seven activities are explained and the pupils are given tables to record their estimates and/or data collected.

For the first three mass activities, I chose household items with which the pupils were likely to be familiar and weights that, for safety reasons, did not exceed 5kg.

The time activities were fairly straight forward; we had practiced the "wall sit" beforehand and modelled by me, so the pupils knew what to expect; it is, after all, quite a demanding exercise.

I had paced out the length of Main Street prior to the day, so I had estimated that it should have taken no more than ten minutes for each group, hence the reason for rotating activities after ten minutes.

Evaluating the "morning":

- The first group to walk Main Street took far too long; they treated it like a leisurely Sunday afternoon stroll and had spoken to pupils who were onsite as they passed the school; so, they had clearly not concentrated on counting their steps. Only five groups completed this activity.
- Some of the pupils had failed to read the activity instructions and had, consequently, either not performed the tasks correctly or entered their data wrongly.
- However, they did all enjoy the activities and would like to do something similar at another time. \*

Maths Reasoning Activity Answer Sheets  
 Group A: Harry, Martha, Rachel & Darcy

Mass Set 1

Task 1 Arrange these ten items in order of increasing mass.

	Harry	Martha	Rachel	Darcy
Fruit Pastilles				
Cotton Buds				
Multi-grain Crackers				
Tangy Tomato Crisps				
Custard				
Fig Rolls				
Sea Salt Crisps				
Dark Chocolate Bar				
Uncle Ben' Rice				
Packet Soup				

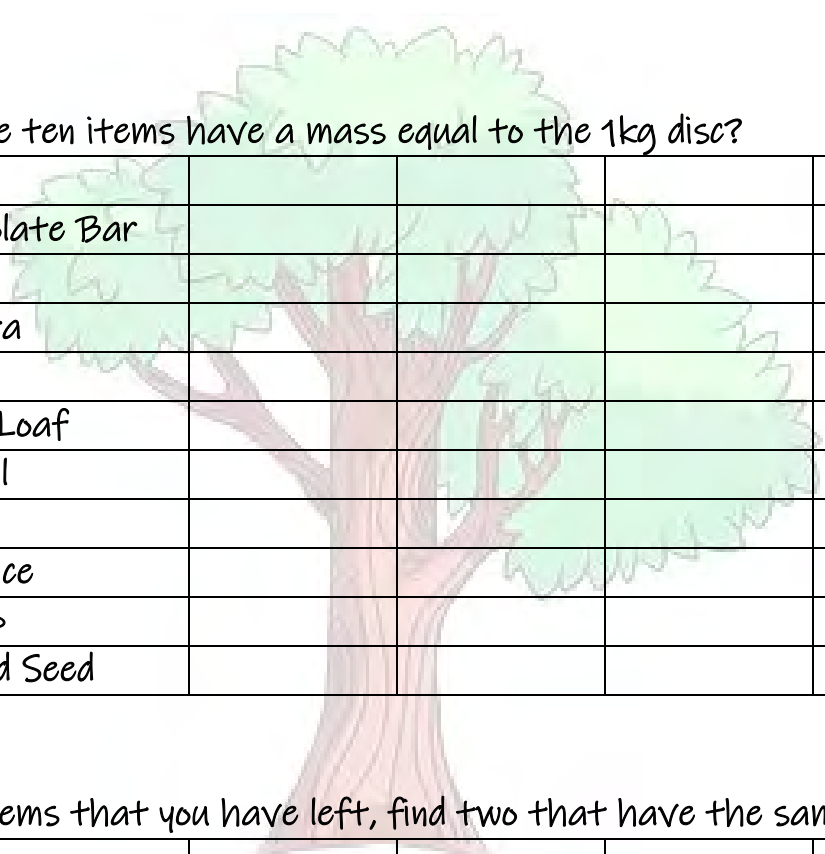
Task 2 How many of each item would have the same mass as the 1kg disc?

Fruit Pastilles				
Cotton Buds				
Multi-grain Crackers				
Tangy Tomato Crisps				
Custard				
Fig Rolls				
Sea Salt Crisps				
Dark Chocolate Bar				
Uncle Ben' Rice				
Packet Soup				

Mass Set 2

Task 1

Which of the ten items have a mass equal to the 1kg disc?



Dark Chocolate Bar				
Melon				
Fusilli Pasta				
Lime Soda				
Fruit Tea Loaf				
Kitchen Foil				
Ginger Ale				
Orange Juice				
Tin of Soup				
Tub of Bird Seed				

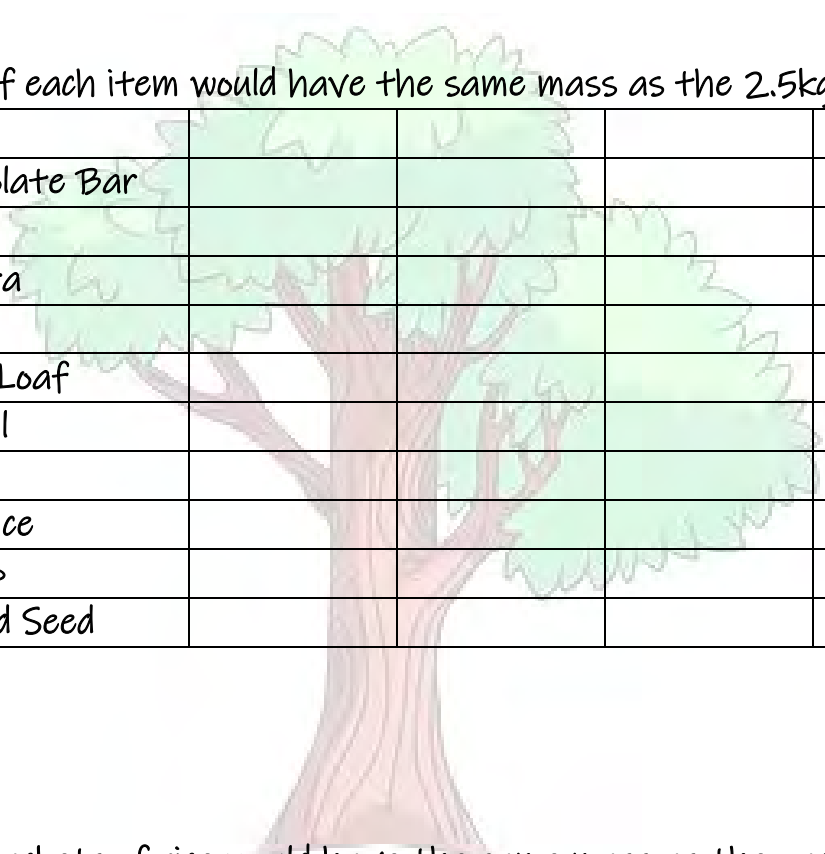
Task 2a

From the items that you have left, find two that have the same mass.

Dark Chocolate Bar				
Melon				
Fusilli Pasta				
Lime Soda				
Fruit Tea Loaf				
Kitchen Foil				
Ginger Ale				
Orange Juice				
Tin of Soup				
Tub of Bird Seed				

### Task 2b

How many of each item would have the same mass as the 2.5kg disc?



Dark Chocolate Bar				
Melon				
Fusilli Pasta				
Lime Soda				
Fruit Tea Loaf				
Kitchen Foil				
Ginger Ale				
Orange Juice				
Tin of Soup				
Tub of Bird Seed				

### Mass Set 3

#### Task 1

How many packets of rice would have the same mass as the packet of pasta?

#### Task 2

How many packets of rice would have the same mass as the 2.5kg disc?

#### Task 3

How many packets of pasta would have the same mass as the 2.5kg disc?

#### Task 4

How many packets of pasta would have the same mass as the black plate?

#### Task 5

Use as many of the dumbbells as you need to make a total mass equal to the mass of the black plate.

#### Task 6

Estimate my mass in kilograms, to one decimal place.

Task 1				
Task 2				
Task 3				
Task 4				
Task 5				
Task 6				

### Time 1

Estimating the duration of 2 minutes.

Take turns to time the other group members as they estimate the duration of 2 minutes. Record your results in the table below.

	Harry	Martha	Rachel	Darcy
Round 1	Timer			
Round 2		Timer		
Round 3			Timer	
Round 4				Timer

### Time 2

Estimating the time taken for each of your team members (in turn) to run to one end of the field to the other, and back.

One team member has the stopwatch, one team member runs while the other two team members estimate how long the run takes.

Actual Time (Below)	Harry	Martha	Rachel	Darcy
	Timer			Run
	Run	Timer		
		Run	Timer	
			Run	Timer

### Time 3

Task 1: How long does it take to do each of the following?

	Harry	Martha	Rachel	Darcy
Ten Star Jumps				
Run the perimeter of the (yellow) netball court				

Task 2: For how long can you "sit" against the wall?

	Harry	Martha	Rachel	Darcy
Best Time/s				

## Length/Distance

Just one Task for this basic unit (i.e., length).

You are to estimate the distance from one end of Main Street to the other (as indicated by the white lines at each end of the road).

	Mean stride/m	Total steps	Stride x steps = estimate/m
Harry	0.50		
Martha	0.51		
Rachel	0.57		
Darcy	0.44		

Mean stride length (m) x Total steps counted = Your estimate of Main Street.

*\*As a follow-up, the data can be collated and discussed during subsequent Data Collection and Interpretation lessons.*

Lester Williams  
28<sup>th</sup> June 2021

