Discussion Problems
Step 3: Estimate and Approximate

National Curriculum Objectives:

Mathematics Year 5: (5C1) Add and subtract numbers mentally with increasingly large numbers
Mathematics Year 5: (5C3) Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

About this resource:

This resource has been designed for pupils who understand the concepts within this step. It provides pupils with more opportunities to enhance their reasoning and problem solving skills through more challenging problems. Pupils can work in pairs or small groups to discuss with each other about how best to tackle the problem, as there is often more than one answer or more than one way to work through the problem.

There may be various answers for each problem. Where this is the case, we have provided one example answer to guide discussion.

We recommend self or peer marking using the answer page provided to promote discussion and self-correction.

More Year 5 Addition and Subtraction resources.

Did you like this resource? Don't forget to review it on our website.

Estimate and Approximate

1. Managers of the food chain, Maccydoodles, are estimating the total takings for the day at 6 of their restaurants.

Restaurant	Total takings
Manchester	£482.65
Halifax	£593.70
London	£743.38
Newcastle	£2,364
Cardiff	£482.64
Edinburgh	£795.61

Use your knowledge of rounding to explore three approximate totals for all of the restaurants combined.

DP

2. An aeroplane makes a journey from Heathrow to Istanbul each day, via Brussels and Sweden. The aeroplane's fuel tank has a capacity of 26,020L and it burns 2,839L of fuel each hour in flight.

Flight Plan			Direct return journey
Heathrow to Brussels	Brussels to Malmö	Malmö to Istanbul	
1 hour	2.5 hours	3.5 hours	5 hours

Possible refuelling stops	Journey time from Istanbul
Bucharest	1 hour
Budapest	2 hours
Sofia	1.5 hours
Riga	2.5 hours
Paris	3.5 hours

Look at the flight plan and use your knowledge of approximation to explore whether the aeroplane has enough fuel to reach Istanbul and then make a direct, return journey to Heathrow, or whether it needs to stop to refuel on the way back. If so, which cities can it reach to refuel?

DP

Estimate and Approximate

1. Managers of the food chain, Maccydoodles, are estimating the total takings for the day at 6 of their restaurants.

Restaurant	Total takings	Rounded to the nearest whole number
Manchester	£482.85	£483
Halifax	£593.70	£594
London	£743.38	£743
Newcastle	£2,364	£2,364
Cardiff	£482.74	£483
Edinburgh	£795.91	£796
	Total	£5,463

Use your knowledge of rounding to explore three approximate totals for all of the restaurants combined. Various answers, for example: the amounts could be rounded to the nearest whole number (as shown above) or they could be rounded to the nearest 10, 100, 50, 500 etc.

DP

2. An aeroplane makes a journey from Heathrow to Istanbul each day, via Brussels and Sweden. The aeroplane's fuel tank has a capacity of 26,020L and it burns 2,839L of fuel each hour in flight.

Flight Plan			Direct return journey
Heathrow to Brussels	Brussels to Malmö	Malmö to Istanbul	
1 hour	2.5 hours	3.5 hours	5 hours

Possible refuelling stops	Journey time from Istanbul
Bucharest	1 hour
Budapest	2 hours
Sofia	1.5 hours
Riga	2.5 hours
Paris	3.5 hours

Look at the flight plan and use your knowledge of approximation to explore whether the aeroplane has enough fuel to reach Istanbul and then make a direct, return journey to Heathrow, or whether it needs to stop to refuel on the way back. If so, which cities can it reach to refuel? Various answers, for example: If rounded to the nearest 500, the answer would be: (Heathrow to Brussels) 3,000L + (Brussels to Malmö) 7,500L + (Malmö to Istanbul) 10,500L = 21,000L of fuel used. Therefore, the plane does not have enough fuel to make a direct, return journey to Heathrow. The plane could go as far as Bucharest or Sofia to refuel.

DP