

## Some more ideas to get you started...

### What would happen if Father Christmas ate a mince pie at every house he visited?

- How many people live in the world?
- What's the average number of people per household?
- How many houses does he visit?
- How many mince pies does he eat?
- How many calories in one mince pie?
- How many calories does he eat?
- What might Father Christmas need to do to burn that many calories?



### How many reindeer would be needed to pull Father Christmas' sleigh?

- How much does his sleigh weigh?
  - How much might one present weigh?
  - How many presents would Santa carry?
    - How many people need a present at Christmas?
- Estimate what weight you could pull. A grand piano (500kg)? A small car (1000kg)? A large car (2000kg)? More? Less?
- Estimate how much a reindeer could pull. More than you? Less than you? The same amount?
- How many reindeer would be needed to pull Father Christmas' sleigh?
- What else could you use to pull the sleigh, and how many would you need?



### How much does Father Christmas spend each year?

*Does he make the presents, or buy them?*

#### Make

- How much does he give to the elves making presents?
  - How many presents need to be made?
  - How long does it take to make each one?
  - How many elf-hours is that?
  - What is the elves' hourly rate?

- ...or what about a combination of both?
- Does Father Christmas spend any money on fuel?
- What about any other expenses?
- What else could be purchased with that amount of money?

#### Buy

- How much does the purchase of the presents cost?
  - How many presents need to be made?
  - How much does Father Christmas spend on average per present?



## How many elves would Father Christmas need to employ to reach all the houses in time?

- How many houses need to be visited?
  - How many people live in the world?
  - What's the average number of people per household?
  - How many houses does he visit?
- How much time needs to be spent at each house?
- How much time does it take to travel between houses?
- How many houses can 1 elf visit in 24 hours?
- How many elves are needed?



## How many individual production-elves does Father Christmas need to hire year-round to build the Christmas presents?

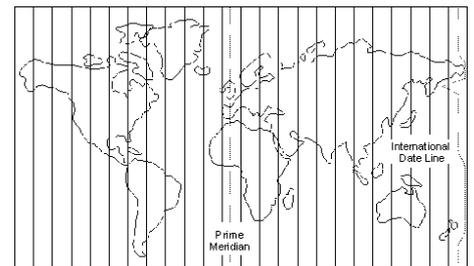
- How many hours should an elf work in a day?
- How many weeks should an elf work in a year? (think about holiday time)
- So how many hours does each elf work throughout the year?
- How many presents need to be made?
- How many children are there?
- How many presents do they each receive?
- How long does it take an elf to make one present?
- How many hours would it take to make all the presents?
- So how many elves are needed?



## How much fuel would it take Father Christmas to travel to each house on Christmas?

*Let's assume some things...*

1. *The sleigh runs on petrol*
2. *To try and be efficient while delivering presents, Santa cuts a map into 24 strips, each one a different time zone. He travels vertically through each zone once, delivering presents to the whole zone at a time.*



- What MPG (miles per gallon) might this sleigh get?
- How many miles is it from the North pole to the South pole?
- How many miles does he travel in total?
- How many litres of petrol would the sleigh need? How much would it weigh? Is that a reasonable number?
- What if he refuels at each pole?
- What if he refuels more often?
- How much would it all cost?