CHRISTMAS MATHS COMPETITION

We have games, puzzles, books and other edible Christmas goodies up for grabs for this fun festive competition. Prizes will be given to the best three Lower School and best three Upper School entries.

To enter: answer the questions below on the **Entry Form attached** to this email, either by typing your answers in and emailing it to me at **p.mobbs@dauntseys.wilts.sch.uk** or by printing off a blank document and posting your hand-written version in the box in the maths corridor (blank copies of the Entry Forms are also next to the box). You must also **attach your working** for each question (e.g. by photo or scan if emailing, or A4 sheets if paper entry).

All entries to be received by **5.30 pm** on **Monday 7th December**. Good luck!

Question 1:
How many **birds** were given as gifts **in total** in the song "The Twelve Days of Christmas"?

Question 2:
All of Dauntsey's 829 pupils is given an A3 sheet to make a giant paper chain. The sheet is to be cut into 8 strips length-wise (long strips) and made into cylindrical hoops by taping together the top 1 cm and bottom 1 cm of the strip. The hoops will be stapled together side by side like this: ⃝⃝⃝ to make one giant chain. How many times will the resulting chain go round the quad? (You may use the formula: Circumference = π x diameter; and assume the quad is 30 m square.)

Question 3:
In the song "Driving Home for Christmas", Chris Rea laments being "top to toe in tail-backs". The M25 has often been called the world's biggest car park due to the frequent traffic jams. How many cars can be parked on the M25? Assume the M25 is 188 km long, there are three lanes of traffic on average, each car is 4.5 m long and there is a 1 m gap between each car.

Question 4:
For Christmas last year, I went to stay at the Hotel California. It had 272 rooms. Unfortunately, the new kid in town stole all the number 2 digits from the doors of the rooms. How many number 2's did they steal in total?

Question 5:
The wise men, or Magi, came from the East to visit the infant Jesus. No-one knows for sure where they came from exactly, but let's assume their journey started in the capital of Iran and finished at Bethlehem (stopping off for one night at Herod's Palace in Jerusalem en route). How many days did their journey take, assuming the average camel walks at 5 km per hour, for 12 hours per day.

Question 6:
Use a Caesar Shift Cipher to decrypt the message below (with spaces taken out) into the title of a well-known Christmas Carol: DIOCZWGZVFHDYRDIOZM.

Question 7:
Santa has had a long Christmas Eve night delivering presents and he's down to the last four presents left to deliver. Sadly, all the labels have come off. If he sticks the labels back on randomly, what is the probability that **none** of the last four presents are delivered to the right person (hint: look at the possible matchings).

Tie-breaker (optional): submit your own Christmas-themed maths question (with worked answer). Credit will be given for originality, mathematical content, clarity of explanation and entertainment factor.

Dauntsey's