



MANCHESTER ACADEMY

# Functional Skills

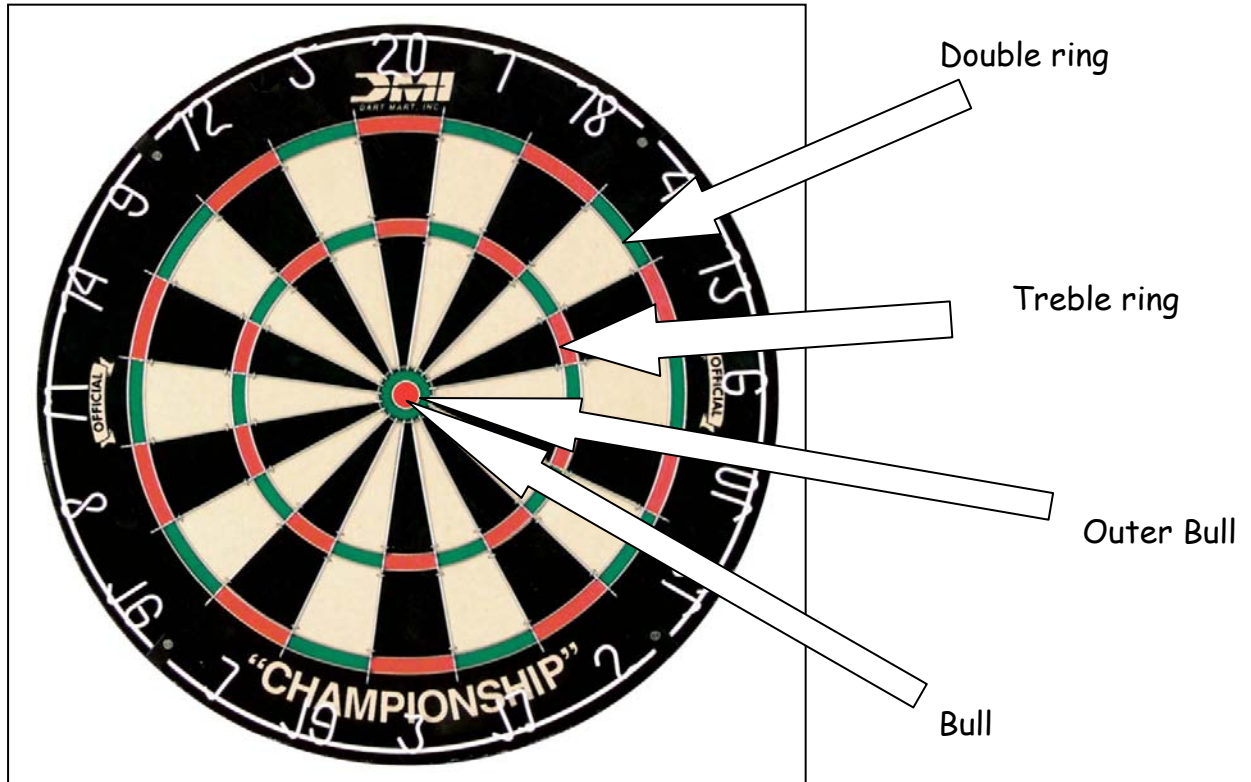
## Task

Years 7, 8, 9

# Darts

# Darts

Darts is a popular game. Players take it in turns to throw three darts at a board like the one shown here.



Depending where the dart lands, it can score a lowest score of 1 to the highest score of 60.

There are 20 sectors. Each sector is worth the score shown on the outside.

Around the outside of each sector is the double ring. If a dart lands in this ring it scores double the value of the sector. Halfway in there is another, smaller ring called the treble ring. A dart landing in this ring scores treble the value of the sector.

In the very centre is a small circle surrounded by a small ring. The middle circle is called the bull and scores 50. The small ring is called the outer bull and scores 25.

The most common darts game is 501. Players take it in turns to throw their darts and their total score is deducted from 501. The first player to finish, by reducing their score to 0, wins. However, to finish, the last dart to reduce the score to 0 must be a double or the bull.

If the final three darts give a total that is greater than the number needed to finish, which means the total scored would be over 501, these throws are void.

Professional darts players are experts at working out finishes for various scores.

For example:

- 164 would require treble 20, treble 18 and the bull
- 105 could be treble 15, single 20 and double 20 or treble 19, single 18 and double 15

Some scores, such as 164, only have one three-dart finish, whereas others, such as 105, have many different three-dart finishes.

### Task 1

In these questions, T means a treble score, D means a double score and S means a single score.

1. What are the following totals for three darts?
  - (a) T18, D6, S3
  - (b) D17, S17, S3
  - (c) T17, D16, S8
  - (d) T15, D10, D6
  - (e) T19, S18, D4
2. A score of 100 has many three-dart finishes. Find a three-dart finish for 100 in which the final dart is:
  - (a) D20
  - (b) bull
  - (c) D16

3. What is the largest number that can be scored with three darts?
4. What is the smallest number that **cannot** be scored with one dart?
5. All the numbers up to 98 can be scored with a two-dart finish. Show a two-dart finish for each of these numbers:
  - (a) 75
  - (b) 98
  - (c) 3
6. Show that 99 is the smallest score that needs a three dart rather than a two-dart finish.
7. Assuming the dart hits the board, the smallest number that can be scored with one dart is 1 and the largest is 60 (T20). Work out which scores between 1 and 60 cannot be scored with one dart.

## Task 2

1. Look at the dartboard below.



The numbers 20 and 3 are on opposite sectors. Adding these gives a total of 23.

Which numbers on opposite sectors, when added, give a total that is:

- (a) a total of 24 (there are 2 answers)
- (b) a square number
- (c) the smallest total

2. Look at the dartboard again.

The numbers 20 and 3 are on opposite sectors. Subtracting the smaller number from the bigger gives a difference of 17.

Which numbers on opposite sectors have a difference that is:

- (a) 12 (there are 2 answers)
- (b) a square number
- (c) the biggest possible

3. Look at the dartboard again.

The numbers 20 and 5 are on adjacent sectors (next to each other). Adding these gives a total of 25.

Which numbers on adjacent sectors, when added, give a total that is:

- (a) 25 (there are 2 more answers)
- (b) a square number other than 25
- (c) 19 (there are 4 answers)

- (d) the largest possible
- (e) the smallest possible

4. The total of all the numbers on the dartboard is:

$$1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16+17+18+19+20$$

The answer is 210. Explain an easy way to work this out without adding up all the numbers.

(Hint:  $10+11=21$  and  $9+12=21$ )

Try to use this method to add up all the numbers from 1 to 100!

### **Task 3**

The 'perfect' way to win a darts match is with a 'nine-darter'. This is because the lowest possible number of darts that can be thrown to score 501 and finish on a double is 9.

Work out how this can be done. There is more than one answer.

### **Task 4**

What is the total of all the scoring areas of a dartboard? This means the total of all the sectors, all the doubles, all the trebles plus the bull and outer bull!