Topic Check In - 11.01 Basic probability and experiments

Use the diagram below in questions 1 and 2.

1. Draw an arrow to show the probability that when a fair coin is thrown it lands on heads.

2. Draw an arrow to show the probability that an 8 is rolled on a fair, normal 6-sided dice.

3. Jim rolls a fair, normal 6-sided dice. What is the probability that the number he throws is less than 5?

4. A bus was late 3 times in 10 journeys. Approximately how many times would you expect the bus to be late in 120 journeys?

5. What word would describe a probability of 1?

6. On a fairground game a fair, normal 6-sided dice is rolled and a fair coin is tossed. To win a prize you need a head and an odd number. Show that the probability of winning a prize is $\frac{1}{4}$.

7. Lee flips 2 fair coins. He says that the probability of getting one head and one tail is $\frac{1}{3}$. Explain why he is not correct.

8. Robert records that he stopped at 3 out of 14 sets of traffic lights on the way to school on Monday morning. He makes the same journey to and from school every day.

   He says “I will stop at exactly 30 sets of lights this week.” Is he correct?

9. Xanthe sells coffee from a stall. $\frac{2}{5}$ of her customers have 1 sugar lump in their coffee and $\frac{1}{8}$ of her customers have 2 sugar lumps, and the rest have no sugar. Assuming she sells 200 cups of coffee in a day, how many sugar lumps might she expect to need?

10. In an experiment a dice is rolled 400 times. The results are recorded below.

Score	1	2	3	4	5	6
Frequency	68	65	36	97	63	64

What do these results suggest about the dice?

Extension

Most scientific calculators have functions that can generate random numbers. Investigate how to generate a random number between 1 and 10 using your calculator.

Answers

1. Arrow at 0.5
2. Arrow at 0
3. $\frac{2}{3}$
4. 36
5. Certain
6. $\frac{1}{2}\times\frac{1}{2}=\frac{1}{4}$ or student draws sample space
7. There are 4 outcomes HH, HT, TH, TT so the probability is $\frac{1}{2}$.
8. Probably not. Robert has assumed he will always be stopped 3 times on each journey, but this will be random because he may travel at different times, and there may be more or less traffic on different days.
9. $\frac{2}{5}\times 200+\frac{1}{8}\times 200=80+25=105$ sugar lumps
10. Dice may be biased as 4 occurs lots more, and the opposite face 3 occurs much less.

Extension

Will depend on calculator model.

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AO1	1	Probability scale.			
AO1	2	Probability scale.			
AO1	3	Calculate probability.			
AO1	4	Relative frequency as estimate of probability.			
AO1	5	Use vocabulary of probability.			
AO2	6	Calculate probability of two independent events.			
AO2	7	Calculate probability.			
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