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| Year  7 | | *Sample Space and Probability* | Non Calculator  Section |
| **Skills and Knowledge Assessed:**   * Construct sample spaces for single- step experiments with equally likely outcomes (ACMSP167) * Assign probabilities to the outcomes of events and determine probabilities for events (ACMSP168) * Identify complementary events and use the sum of probabilities to solve problems (ACMSP204) | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| *Answer all questions in the spaces provided on this test paper by:*  *Writing the answer in the box provided.*  *or*  *Shading in the bubble for the correct answer from the four choices provided.*  *Show any working out on the test paper. Calculators are* ***not*** *allowed.* | | | |
|  | **Questions 1 – 3 refer to the following:**  In an experiment, Jack rolls a cube which has one red, two green and three blue faces. | | |
|  | List the sample space for the experiment. | | |
|  | What is the probability that the cube will show a red face uppermost? | | |
|  | What is the probability that it will show a blue face uppermost? | | |
|  | **Questions 4 – 6 refer to the following**  Mitchell is asked to pick a day in November for an appointment. He randomly chooses a date. | | |
|  | How many outcomes are in the sample space? | | |
|  | What is the probability that he picks the 11th of November? | | |
|  | What is the probability that he picks a Monday (refer to the calendar shown above)? | | |
|  | **Questions 7 – 9 refer to the following :**  Harry has some games on his phone.  Four are shooting games, two are driving games and six are adventure games.  He picks a game at random. | | |
|  | How many outcomes are in the sample space for Harry choosing a game? | | |
|  | What is the probability that Harry chooses a driving game? | | |
|  | What is the probability that Harry chooses a shooting game? | | |
|  | Which term would best describe the likelihood of a large meteor hitting the school today?  likely unlikely  extremely unlikely impossible | | |
|  | Which of these events would have a probability of zero?  Drawing an ace from a normal pack.  Drawing a club from a normal pack.  Rolling a 1 on a normal die.  Rolling a 7 on a normal die. | | |
|  | A bag contains 4 red, 5 black, 3 pink, 2 yellow, 2 green and 4 blue marbles. A marble is drawn at random from the bag.  What is the probability that it is red? | | |
|  | The probability of winning a game is  What is the probability of not winning the game? | | |
|  | **Questions 14 – 15 refer to the following :**  Kerrie spend 6 hours each day training for swimming trials.  She also spends three hours each day eating and nine hours sleeping. | | |
|  | Kerrie’s aunt in the UK who has trouble with time zones, rings at all sorts of random times.  What is the probability that Kerrie is not sleeping when her aunt rings? | | |
|  | What is the probability that Kerrie is training or sleeping when her aunt rings? | | |
|  | Suzie drops over to visit Kerrie during the hours when she is awake.  What is the probability that Kerrie is not eating or training when Suzie visits? | | |
|  | **Questions 17 – 18 refer to the following :**  Leisa observes the birds outside her window for an hour each morning for a week and records the number of each type of bird.  The results are recorded in the table below.     |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Type of Bird | Kookaburra | Noisy Miner | Shrike Thrush | Bower Bird | Wattle Bird | | Number Observed | 28 | 30 | 42 | 24 | 36 | | | |
|  | Based on Leisa’s results, what is the probability that the next bird that will appear outside her window in the morning is a Noisy Miner? | | |
|  | What is the probability that the next bird would not be a Kookaburra? | | |

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| Year  7 | | *Sample Space and Probability* | Calculator Allowed  Short Answer  Section |
|  | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| *Answer all questions in the spaces provided on this test paper by:*  *Writing the answer in the box provided.*  *or*  *Shading in the bubble for the correct answer from the four choices provided.*  *Show any working out on the test paper. Calculators are allowed.* | | | |
|  | Questions 1 and 2 refer to the following :  Five coloured cards are placed face down on a table.  Two are red and the rest are blue.  One card is selected at random. | | |
|  | Write down the sample space for this experiment. | | |
|  | What is the probability of drawing a blue card? | | |
|  | Which of these events could be described as being unlikely to occur in any single experiment?  Drawing a red ace from a normal pack.  Drawing a card from a red suit from a normal pack.  Rolling a number less than 4 on a normal die.  Rolling a 7 on a normal die. | | |
|  | Which probability indicates that there is “less than an even chance” of an event occurring?  0.2 0.5 0.8 1.0 | | |
|  | A desk has twenty paperclips spread over it.  Most of them are plastic coated but four are not.  One paperclip is picked up at random.  What is the probability that it is plastic coated? | | |
|  | There are some candy bars in the Mandy’s mum’s bag.  Three are Mors Bars, two are Snackers Bars and one is a Boast Bar.  Mandy picks out one bar at random from the bag.  What is the probability that it is a Snackers Bar? | | |
|  | **Questions 7 and 8 refer to the following:**  A bag contains 100 marbles.  There are 99 black marbles and 1 white marble.  A marble is selected at random from the bag. | | |
|  | Which term describes the probability that the marble selected is white?  very likely unlikely  very unlikely impossible | | |
|  | What is the probability that the marble selected is black?  0.01 0.1 0.9 0.99 | | |
|  | **Questions 9 and 10 refer to the following:**  In a shopping centre car park there are 10 vans, 120 cars and 30 motorbikes.  Louise picks a random vehicle in the car park to receive a free weeks parking. | | |
|  | What is the probability that the vehicle is a car ? | | |
|  | What is the probability that the vehicle is a van ? | | |
|  | **Questions 11 and 12 refer to the following:**  Josie makes an octagonal spinner with equal sized sectors, numbered from 1 to 8.  She spins the spinner once. | | |
|  | What is the probability that it will land on a number which is less than 7? | | |
|  | What is the probability that it will land on a number which is a multiple of 3? | | |
|  | The Weather Bureau estimates the probability of rain tomorrow is 0.45.  What is the probability of it not raining tomorrow? | | |
|  | **Questions 14 and 15 refer to the following**:  A set of pedestrian lights at a crossing near Felix house stay green for 30 seconds, then flash for 15 seconds and then remain red for 45 seconds. | | |
|  | What is the probability that it will not be green when Felix next reaches the crossing? | | |
|  | What is the probability that it will be flashing or green when Felix next reaches the crossing? | | |
|  | **Questions 16 – 18 refer to the following:**  Anjali finds a tetrahedron die in an old game box.  She rolls it 60 times to see if it is a fair die.  Her results are shown in the table below.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Number | 1 | 2 | 3 | 4 | | Occurrences | 12 | 14 | 14 | 20 | | | |
|  | Based on Anjali’s experiment, is the die fair?  Explain your answer.  ………………………………………………………………………………………………………………………………………………….  ………………………………………………………………………………………………………………………………………………… | | |
|  | Based on Anjali’s experiment, what is the probability of rolling a number more than 2 on the die? | | |
|  | Based on Anjali’s experiment, what is the probability of not rolling a 3? | | |

Sample Space and Probability

ANSWERS

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| Non Calculator Section ( 1 mark each) |

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|  | **Questions 1 – 3 refer to the following:**  In an experiment, Jack rolls a cube which has one red, two green and three blue faces. |
|  | List the sample space for the experiment.    { Red, Green, Green, Blue, Blue Blue} |
|  | What is the probability that the cube will show a red face uppermost?  1  6 |
|  | What is the probability that it will show a blue face uppermost? |
|  | **Questions 4 – 6 refer to the following**  Mitchell is asked to pick a day in November for an appointment. He randomly chooses a date. |
|  | How many outcomes are in the sample space?  30 |
|  | What is the probability that he picks the 11th of November?    1  30 |
|  | What is the probability that he picks a Monday (refer to the calendar shown above)?  2  15 |
|  | Questions 7 – 9 refer to the following :  Harry has some games on his phone.  Four are shooting games, two are driving games and six are adventure games.  He picks a game at random. |
|  | How many outcomes are in the sample space for Harry choosing a game?  12 |
|  | What is the probability that Harry chooses a driving game?  1  6 |
|  | What is the probability that Harry chooses a shooting game? |
|  | Which term would best describe the likelihood of a large meteor hitting the school today?  likely unlikely  extremely unlikely impossible |
|  | Which of these events would have a probability of zero?  Drawing an ace from a normal pack.  Drawing a club from a normal pack.  Rolling a 1 on a normal die.  Rolling a 7 on a normal die. |
|  | A bag contains 4 red, 5 black, 3 pink, 2 yellow, 2 green and 4 blue marbles. A marble is drawn at random from the bag.  What is the probability that it is red?  1  5 |
|  | The probability of winning a game is  What is the probability of not winning the game? |
|  | Questions 14 – 15 refer to the following :  Kerrie spend six hours each day training for swimming trials.  She also spends three hours each day eating and nine hours sleeping. |
|  | Kerrie’s aunt in the UK who has trouble with time zones, rings at all sorts of random times.  What is the probability that Kerrie is not sleeping when her aunt rings? |
|  | What is the probability that Kerrie is training or sleeping when her aunt rings?  5  8 |
|  | Suzie drops over to visit Kerrie during the hours when she is awake.  What is the probability that Kerrie is not eating or training when Suzie visits?  2  5 |
|  | Questions 17 – 18 refer to the following :  Leisa observes the birds outside her window for an hour each morning for a week and records the number of each type of bird.  The results are recorded in the table below.     |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Type of Bird | Kookaburra | Noisy Miner | Shrike Thrush | Bower Bird | Wattle Bird | | Number Observed | 28 | 30 | 42 | 24 | 36 | |
|  | Based on Leisa’s results, what is the probability that the next bird that will appear outside her window in the morning is a Noisy Miner?  3  16 |
|  | What is the probability that the next bird would not be a Kookaburra?  33  40 |

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| Calculator Allowed Short Answer Section ( 1 mark each) | |
|  | | Questions 1 and 2 refer to the following :  Five coloured cards are placed face down on a table.  Two are red and the rest are blue.  One card is selected at random. | |
|  | | Write down the sample space for this experiment.  {Red, Red, Blue, Blue, Blue} | |
|  | | What is the probability of drawing a blue card?  3  5 | |
|  | | Which of these events could be described as being unlikely to occur in any single experiment?  Drawing a red ace from a normal pack.  Drawing a card from a red suit from a normal pack.  Rolling a number less than 4 on a normal die.  Rolling a 7 on a normal die. | |
|  | | Which probability indicates that there is “less than an even chance” of an event occurring?  0.2 0.5 0.8 1.0 | |
|  | | A desk has twenty paperclips spread over it.  Most of them are plastic coated but four are not.  4  5  One paperclip is picked up at random.  What is the probability that it is plastic coated? | |
|  | | There are some candy bars in the Mandy’s mum’s bag.  Three are Mors Bars, two are Snackers Bars and one is a Boast Bar.  Mandy picks out one bar at random from the bag.  What is the probability that it is a Snackers Bar? | |
|  | | **Questions 7 and 8 refer to the following:**  A bag contains 100 marbles.  There are 99 black marbles and 1 white marble.  A marble is selected at random from the bag. | |
|  | | Which term describes the probability that the marble selected is white?  very likely unlikely  very unlikely impossible | |
|  | | What is the probability that the marble selected is black?  0.01 0.1 0.9 0.99 | |
|  | | **Questions 9 and 10 refer to the following:**  In a shopping centre car park there are 10 vans, 120 cars and 30 motorbikes.  Louise picks a random vehicle in the car park to receive a free weeks parking. | |
|  | | What is the probability that the vehicle is a car? | |
|  | | What is the probability that the vehicle is a van ?  1  16 | |
|  | | **Questions 11 and 12 refer to the following:**  Josie makes an octagonal spinner with equal sized sectors, numbered from 1 to 8.  She spins the spinner once. | |
|  | | What is the probability that it will land on a number which is less than 7? | |
|  | | What is the probability that it will land on a number which is a multiple of 3?  1  4 | |
|  | | The Weather Bureau estimates the probability of rain tomorrow is 0.45.  What is the probability of it not raining tomorrow?  0.55 | |
|  | | Questions 14 and 15 refer to the following:  A set of pedestrian lights at a crossing near Felix house stay green for 30 seconds, then flash red for 15 seconds and then remain red for 45 seconds. | |
|  | | What is the probability that it will not be green when Felix next reaches the crossing? | |
|  | | What is the probability that it will be flashing or green when Felix next reaches the crossing?  1  2 | |
|  | | Questions 16 – 18 refer to the following:  Anjali finds a tetrahedron die in an old game.  She rolls it 60 times to see if it is a fair die.  Her results are shown in the table below.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Number | 1 | 2 | 3 | 4 | | Occurrences | 12 | 14 | 14 | 20 | | |
|  | | Based on Anjali’s experiment, is the die fair?  Explain your answer. | |
|  | | Based on Anjali’s experiment, what is the probability of rolling a number more than 2 on the die? | |
|  | | Based on Anjali’s experiment, what is the probability of not rolling a 3?  23  30 | |