Name _____ Period _____

6.2 Probability of a Single Event Exercises:

1. You roll a fair dice. What is the probability that you obtain:
   (a) a *five*, (b) a *three*, (c) an *even* number,
   (d) a multiple of 3, (e) a number *less than* 6 ?

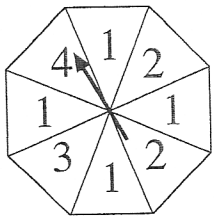
2. A jar contains 9 *red* counters and 21 *blue* counters. A counter is taken at random from the jar. What is the probability that it is:
   (a) *red*, (b) *blue*, (c) *green* ?

3. You take a card at random from a pack of 52 playing cards. What is the probability that the card is:
   (a) a red King, (b) a Queen or a King, (c) a 5, 6 or 7,
   (d) a Diamond, (e) *not* a Club ?

4. A jar contains 4 *red* balls, 3 *green* balls and 5 *yellow* balls. One ball is taken at random from the jar. What is the probability that it is:
   (a) *green*, (b) *red*, (c) *yellow*,
   (d) *not red*, (e) *yellow* or *red* ?

5. The faces of a regular tetrahedron are numbered 1 to 4. When it is rolled it lands face down on one of these numbers. What is the probability that this number is:
   (a) 2, (b) 3,
   (c) 1, 2 or 3, (d) an *even* number ?

6. A spinner is numbered as shown in the diagram.
Each score is equally likely to occur.
What is the probability of scoring:



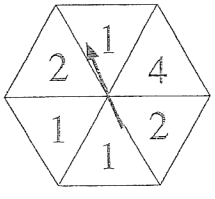
(a) 1, (b) 2,
(c) 3, (d) 4,
(e) 5, (f) a number less than 6 ?

7. You toss a fair coin 360 times.
(a) How many times would you expect to obtain a head?
(b) If you obtained 170 heads, would you think that the coin was biased? Explain why.

8. A spinner has numbers 1 to 5, so that each number is equally likely to be scored. How many times would you expect to get a score of 5, if the spinner is spun:
(a) 10 times, (b) 250 times, (c) 400 times ?

9. A card is drawn at random from a pack of 52 playing cards, and then replaced. The process is repeated a total of 260 times. How many times would you expect the card drawn to be:
(a) a 7, (b) a *red Queen*, (c) a *red* card,
(d) a *Heart*, (e) a card with an *even* number ?

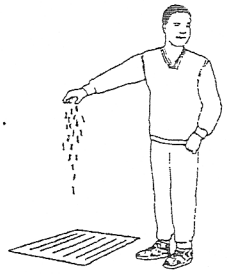
10. A six-sided spinner is shown in the diagram.
It is spun 180 times.
How many times would you expect to obtain:



(a) a score of 1,
(b) a score less than 4,
(c) a score that is a *prime* number, (d) a score of 4 ?

11. Barry is doing an experiment. He drops 20 matchsticks at random onto a grid of parallel lines.

Barry does the experiment 10 times and records his results. He wants to work out an estimate of probability.



Number of the 20 matchsticks that have fallen across a line									
5	7	6	4	6	8	5	3	5	7

(a) Use Barry's data to work out the probability that a *single matchstick* when dropped will fall across one of the lines. Show your working.

(b) Barry continues the experiment until he has dropped the 20 matchsticks 60 times.

About how many matchsticks *in total* would you expect to fall across one of the lines? Show your working.

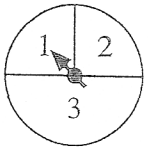
12. Les, Tom, Nia and Ann are in a singing competition. To decide the order in which they will sing all four names are put into a bag. Each name is taken out of the bag, one at a time, without looking.

(a) Write down *all* the possible orders with *Tom* singing *second*.

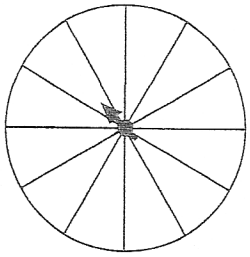
(b) In a different competition there are 8 singers. The probability that Tom sings second is $\frac{1}{8}$.

Work out the probability that Tom does *not* sing second.

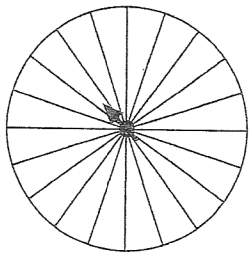
13. (a) What is the probability of getting a 3 on this spinner?



(b) Shade a copy of the following spinner so that the chance of getting a shaded section is double the chance of getting a white section.



(c) Shade a copy of the following spinner so that there is a 40% chance of getting a shaded section.



14. Pat has 5 white beads and 1 black bead in her bag. She asks two friends about the probability of picking a black bead without looking in the bag.

Owen says: "*It is* $\frac{1}{5}$ *because there are 5 white beads and 1 black bead.*"

Maria says: "*It is* $\frac{1}{6}$ *because there are 6 beads and 1 is black.*"

(a) Which of Pat's friends is *correct*? Explain why the other friend is *wrong*.

(b) Tracy has a different bag of black beads and white beads.

The probability of picking a black bead from Tracy's bag is $\frac{7}{13}$.

What is the probability of picking a white bead from Tracy's bag?

(c) How many black beads and how many white beads could be in Tracy's bag?

(d) Peter has a different bag of black beads and white beads.

Peter has more beads in total than Tracy.

The probability of picking a black bead from Peter's bag is also $\frac{7}{13}$.

How many black beads and how many white beads could be in Peter's bag?

15. Brightlite company makes light bulbs. The state of the company's machines can be:

available for use and being used
or available for use but not needed
or broken down.

(a) The table shows the probabilities of the state of the machines in July 1994. What is the missing probability?

State of machines: July 1994	*Probability*
Available for use, being used	
Available for use, not needed	0.09
Broken down	0.03

(b) During another month the probability of a machine being available for use was 0.92. What was the probability of a machine being broken down?

(c) Brightlite calculated the probabilities of a bulb failing within 1000 hours and within 2000 hours.

Copy and complete the table below to show the probabilities of a bulb still working at 1000 hours and at 2000 hours.

Time	*Failed*	*Still working*
At 1000 hours	0.07	
At 2000 hours	0.57	

16. A machine sells sweets in *five* different colours:

red, green, orange, yellow, purple.

You *cannot choose* which colour you get.

There are the *same number* of each colour in the machine.

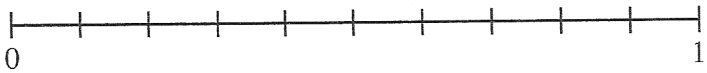
Two boys want to buy a sweet each.

Ken does not like orange sweets or yellow sweets. Colin likes them all.

(a) What is the probability that Ken will get a sweet that he likes?

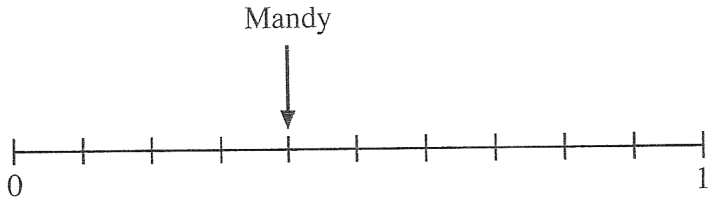
(b) What is the probability that Colin will get a sweet that he likes?

(c) Copy the following scale and draw an arrow to show the probability that Ken will get a sweet that he likes. Label the arrow 'Ken'.



(d) On your scale from (c), draw an arrow to show the probability that Colin will get a sweet that he likes. Label this arrow 'Colin'.

(e) Mandy buys one sweet. The arrow on the following scale shows the probability that Mandy gets a sweet that she likes.



Write a sentence that *could* describe which sweets Mandy likes.