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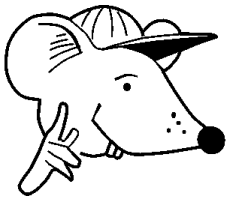
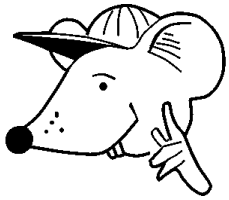


MATHEMATICS



N.S. Yr. 6 P.113

Using language of probability through experiment and theory.

Equipment

Paper, pencil, ruler, squared paper,
computer with database program

MathSphere

Concepts

Children should be familiar with the following vocabulary:
perhaps, might, fair, unfair, biased, random, likely, unlikely, equally likely, chance, certain, uncertain, probable, possible, impossible, good chance, poor chance, no chance, equal chance, even chance, evens, fifty-fifty chance, likelihood, probability, possibility, and, or, not.

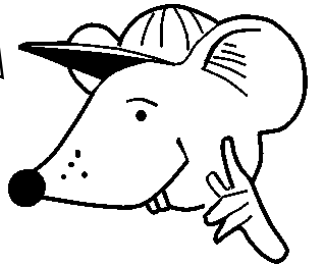
Children should understand the probability scale from 0 to 1 and be able to put events in the appropriate place on the probability scale according to the likelihood of the event happening. A probability of 0 means that something is impossible. A probability of 1 means that something is certain to happen. Sometimes children think that some events have a probability of 0 or 1 when in fact they are quite near these values, but not actually 0 or 1. For example it is highly unlikely that we shall have built a bridge across the Atlantic Ocean by the year 2030, but this is not actually impossible, therefore the probability of it happening is extremely small, but not equal to zero. Likewise, the probability of the Sun rising as usual every morning for the next year is very high but not actually 1 as there is a very small chance of some cataclysmic event happening in the Solar System.

Children should be able to give the probability of simple outcomes, eg the chance of obtaining a 2 on a normal die is $^1/_6$.

1.

You should be able to give a number to a probability. These numbers must be between **0** and **1**. They may be fractions or decimals.

Eg. The probability of getting a head when you toss a coin is $\frac{1}{2}$, but this can be written as **0.5**



Can you give a number for the probability of these events happening?

a) Throwing a die and getting a 2.

b) Throwing a die and getting an even number.

c) Throwing a die and getting a zero.

d) Throwing a die and getting a number greater than 4.

e) Throwing a die and getting a 1, 2, 3, 4, 5 or 6.

f) Tossing a coin and getting a tail.

g) Tossing a coin and getting a 5.

h) Tossing a coin and getting a head or a tail.

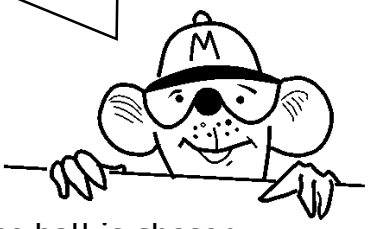
i) Choosing a heart from a pack of cards.

j) Choosing the six of spades from a pack of cards.

k) Choosing one person in your class at random and that person being a girl.

1.

Here are some simple experiments. Think about them carefully and then work out the probability of the event happening.



a) A bag contains six blue balls and four green balls. One ball is chosen without looking at its colour. What is the probability it is green?

b) A spinner has the numbers from **1** to **20** on it. If it is spun, what is the probability of getting an even number?

c) A spinner has the numbers from **1** to **20** on it. If it is spun, what is the probability of getting a prime number?

d) A milkcrate contains ten red top and four silver top bottles of milk. A bird lands on one of the milk bottles. What is the probability it lands on a silver top?

e) Twenty cards are laid out on a table. Four are green. Six are yellow. Ten are blue. A boy throws a dart at the table. If the dart hits one of the cards, what is the probability it is a yellow card?

f) Six boys and five girls are in a lift. One of the children feels ill. What is the probability it is one of the boys?

g) A factory has sixteen workshops. Accidents happened in three of them today. What is the probability of working in a workshop which had an accident?

h) In a batch of **1 000** nails, twelve were faulty. If one of the nails is chosen at random, what is the probability it is a faulty one?

Now draw a probability line from 0 to 1 and put the above events on the line in the correct places.

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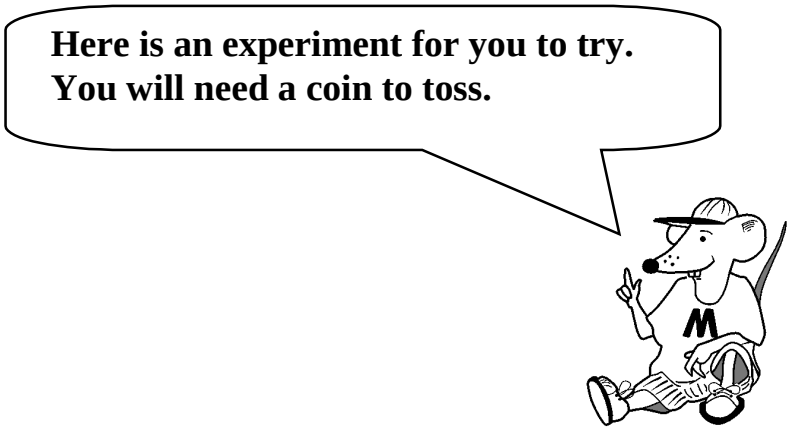

You are going to toss the coin **10** times, then **20** times, then **30** times.

Before you do, how many heads and how many tails do you think you should get for each go? Write what you think in this table:

Number of tosses	Number of Heads	Number of Tails
10		
20		
30		

Now toss the coin **10**, **20** and then **30** times and write in the next table how many heads and how many tails you had:

Number of tosses	Number of Heads	Number of Tails
10		
20		
30		

Did you get the same number of heads and tails in both tables?
Discuss your results with your teacher or parent.

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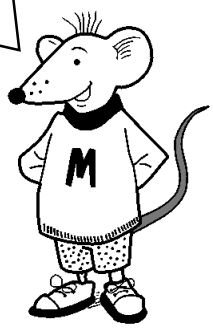
Here is an experiment for you to try.

You will need to carry out a survey to find out how many brothers and how many sisters the people in your class have, until you have 60 brothers and sisters altogether.



Before you do, how many brothers and how many sisters do you think they should have? Write what you think in this table:

Number Altogether	Number of Brothers	Number of Sisters
60		

Now ask people about their brothers and sisters and write in the next table how many brothers and how many sisters they had. You may need to ask people in other classes.

Number Altogether	Number of Brothers	Number of Sisters
60		

Did you get the same number of brothers and sisters in both tables?
Discuss your results with your teacher or parent.

Now repeat the experiment, but this time count men and women over 60 years old. You will need lots of grandmas and grandpas!!!

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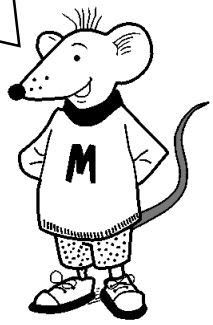
Here is an experiment for you to try.

You will need to throw a normal six sided die 50 times and record the number of times you get an odd number and the number of times you get an even number.



Before you do, how many odd numbers and how many even numbers do you think you should get? Write what you think in this table:

Number of Throws	Number of Odd Numbers	Number of Even Numbers
50		

Now throw your die and write in the next table how many odd numbers and how many even numbers you threw.

Number of Throws	Number of Odd Numbers	Number of Even Numbers
50		

Did you get the same number of odd numbers and even numbers in both tables? Discuss your results with your teacher or parent.

Would you get the same number of odd numbers and even numbers if you repeated the experiment?

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Here is an experiment for you to try.

You will need to put ten red and ten blue cubes or balls in a box or bag, so that you can take them out one at a time, but not see which colour you are choosing. Put the cube back each time you choose one.

Before you do this, how many red cubes and how blue cubes do you think you should get if you choose **80** times? Write what you think in this table:

Number of Choices	Number of Red Cubes	Number of Blue Cubes
80		

Now choose a cube **80** times and write in the next table how many red cubes and how many blue cubes you chose.

Number of Choices	Number of Red Cubes	Number of Blue Cubes
80		

Did you get the same number of red cubes and blue cubes in both tables? Discuss your results with your teacher or parent.

Would you get the same number of red cubes and blue cubes if you repeated the experiment?

Answers

Page 3

1. **Probabilities here are given as fractions, but equivalent decimals are just as valid.**

a) 1/6 **b)** 1/2 or 3/6 **c)** 0 **d)** 2/6 or 1/3 **e)** 1 or 6/6 **f)** 1/2 **g)** 0
h) 1 or 2/2 **i)** 1/4 or 13/52 **j)** 1/52 **k)** depends on class.

Page 4

1. **Probabilities here are given as fractions, but equivalent decimals are just as valid.**

a) 4/10 or 2/5 **b)** 1/2 or 10/20 **c)** 8/20 or 2/5 **d)** 4/14 or 2/7 **e)** 6/20 or 3/10
f) 6/11 **g)** 3/16 **h)** 12/1000 or 3/250

Pages 5, 6, 7 and 8

Expected results are half of total repetitions, but it is unlikely that in practice this is achieved. Repeating an experiment is unlikely to produce the same results again, although this is not unheard of.

With the older generation question, there should be more women than men.