The chances are..you'll be good at this.

Probability

A year 11 maths text book will have numbers in it.

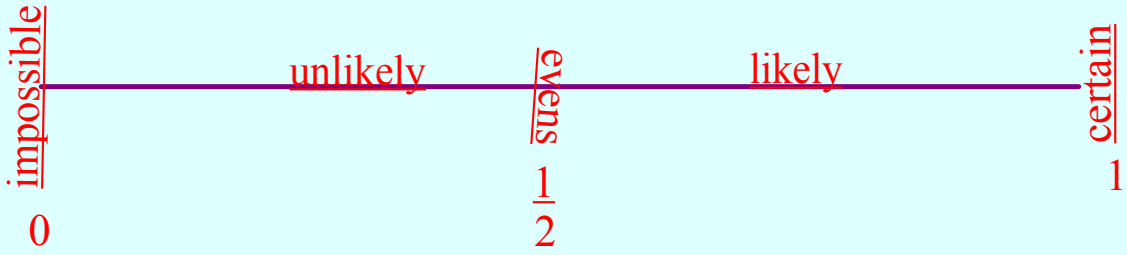
you ask someone at random, they will have a tv

throwing a coin and getting a head

throwing a dice and geting a 1

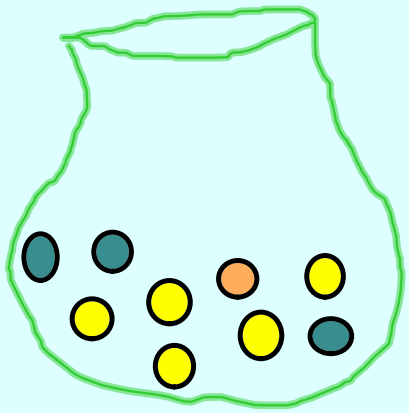
Tomorrow I will be 6ft tall

The Probability Scale



p(getting a 6)= $\frac{1}{6}$

p(not getting a 6)= $\frac{5}{6}$



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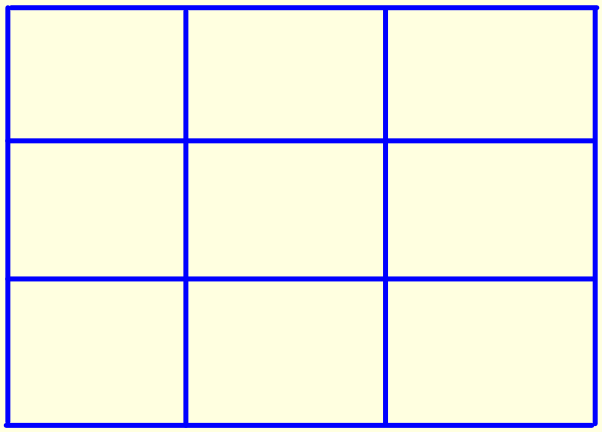
p(yellow)

Dice game with one dice.



What is the probability of getting an even number?

Something to think about..

Tomorrow either it will rain or it won't rain, so the probability of it raining is 1/2.

Next door is a family with 4 boys. The next child will most probably be a girl.

If you throw a coin 50 times and get 48 heads and 2 tails the coin must be biased.

Everyone knows that some people are luckier than others.
And everyone has good days and bad days.
So the probability of throwing a 6 on a dice depends on who throws it and when.

If you throw a coin 50 times you will get 25 heads and 25 tails.

Bag A contains 4 red counters and 2 blue counters.
Bag B contains 5 red counters and 5 blue counters.
You are more likely to pick a red from bag A than you are from bag B.

True or false?

Listing Outcomes

Sometimes the easiest way to show outcomes is simply to list the possibilities.
The main weakness of this strategy is that is easy to forget something.
Work systematically and you will be fine!

$p(\text{even + tail}) = \frac{3}{12}$

List the possible outcomes for throwing a dice and a coin.

H 1
H 2
H 3
H 4
H 5
H 6

T 1
T 2
T 3
T 4
T 5
T 6

$p(T2) = \frac{1}{12}$

$p(3) = \frac{2}{12} = \frac{1}{6}$

$p(H) = \frac{6}{12} = \frac{1}{2}$

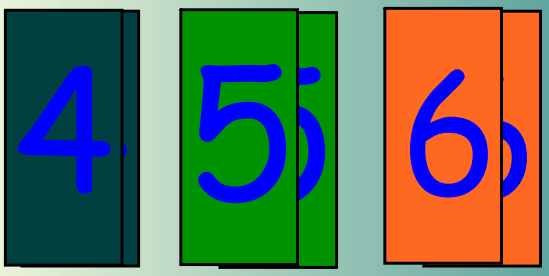
c4) RR RB RG BB BG BR GG GR GB

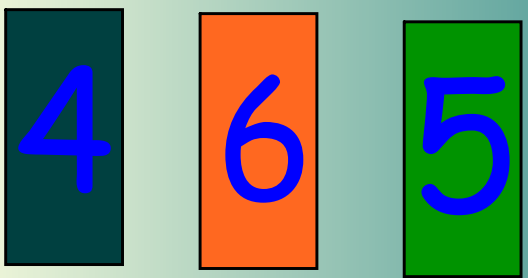
b) 9 c) $\frac{3}{9}$ d) $\frac{6}{9}$

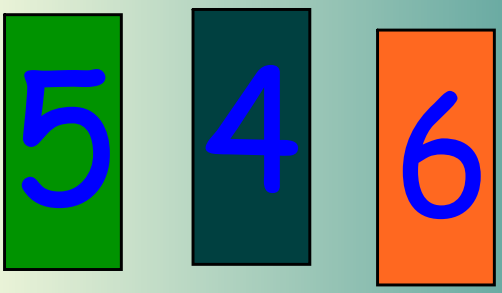
1, 5
1, 6
1, 7

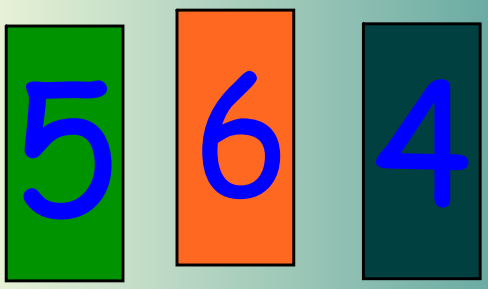
2, 5

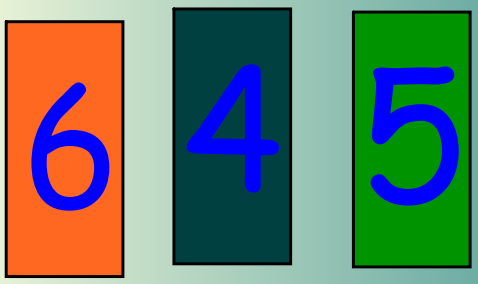
How many ways can you arrange these cards?

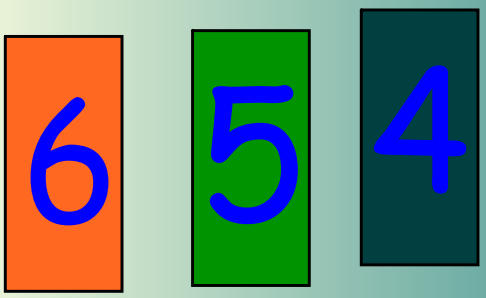




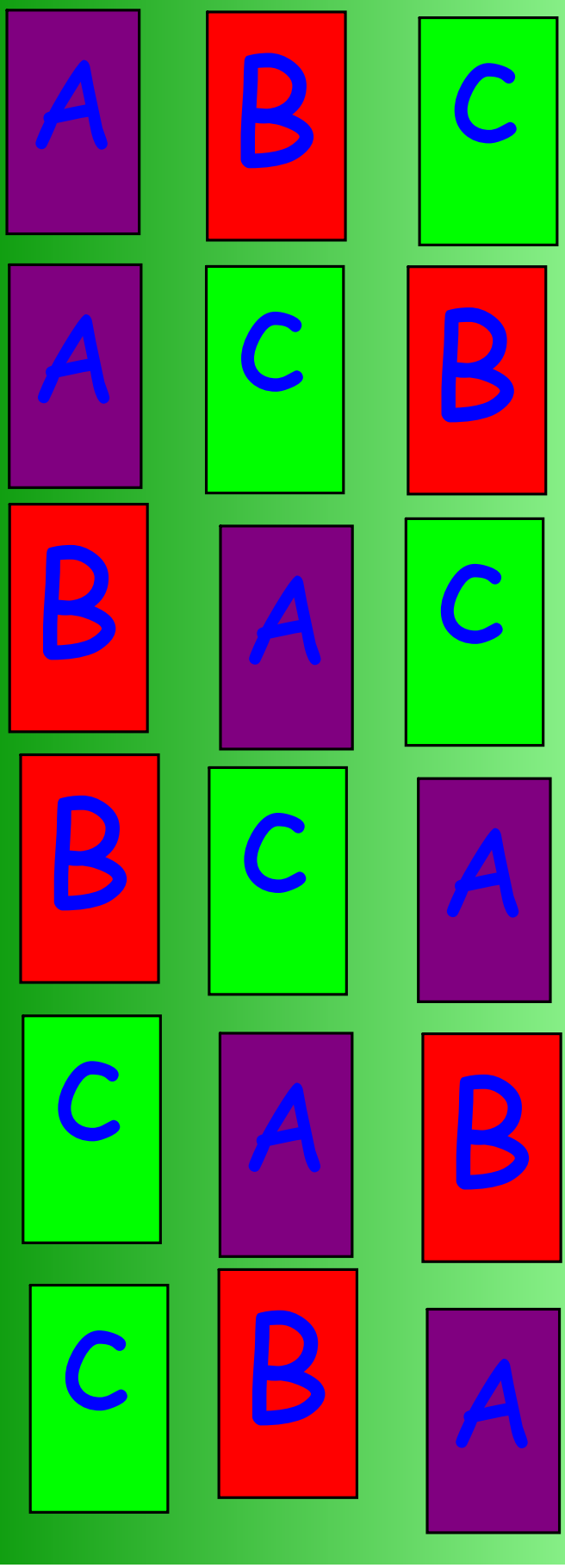




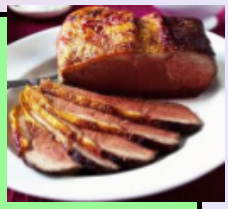




How many ways can you arrange the letters ABC?



Menu



Starters:

Melon

Green salad

Main Course:

Roast beef

Macaroni cheese

Pizza

What are the different combinations you could eat?

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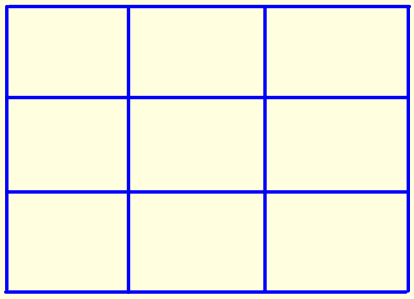
Dice game with two dice.



A sample-space diagram to show the outcomes for rolling two dice.

+	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

p(0)=

p(1)=

p(2)=

p(3)=

p(4)=

p(5)=

p(6)=

p(7)=

p(8)=

p(9)=

p(10)=

p(11)=

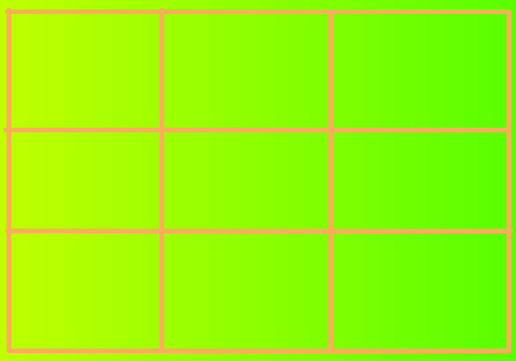
p(12)=

p(13)=

factors worksheet page 257 D1-D5

plenary:
counters in a bag
What do you think I have?

The Great Horse race



A sample-space diagram (for game 2)

+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3					
3						
4						
5						
6						

Find

1) p(5) = $\frac{4}{36}$

2) p (4)= $\frac{3}{36}$

3) p(25)= 0

4) p (8)= $\frac{5}{36}$

5 p (0) = 0

6) p(even no.)= $\frac{18}{36}$

7) p(prime no.)= $\frac{15}{36}$

8) p(square no)= $\frac{7}{36}$

9) p (not a 5) = $\frac{32}{36}$

10) p (triangular no.)= $\frac{10}{36}$

Draw a sample space diagram for the product of the two numbers.
Answer the same questions.

Probability from a two-way table

11M5's TV watching preferences

	soaps	sport	films	series
boys	0	2	6	2
girls	2	0	2	3

10
7
17

If I picked someone at random what is the probability they prefer...

$p(\text{soaps}) = \frac{2}{17}$ $p(\text{series}) = \frac{5}{17}$

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Probability experiments

What's the probability of the carton landing base up?

We threw a carton 30 times. It landed:
sideways
bottom

p(landing sideways) =

Expected Outcomes

I throw a dice 12 times: how many 2s do I expect? Two

Is this certain?

Relative Frequency

A dice is thrown 100 times and these are the outcomes.

no	freq
1	40
2	10
3	15
4	5
5	20
6	10

Do you think the dice is biased?

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mathswatch

Adding to 1

The probability of you being invited to tea with the queen is about 0.001

$p(\text{not invited}) = \frac{999}{1000} = 0.999$

The probability of Mr Matthews hauling one of you out is 1/4.

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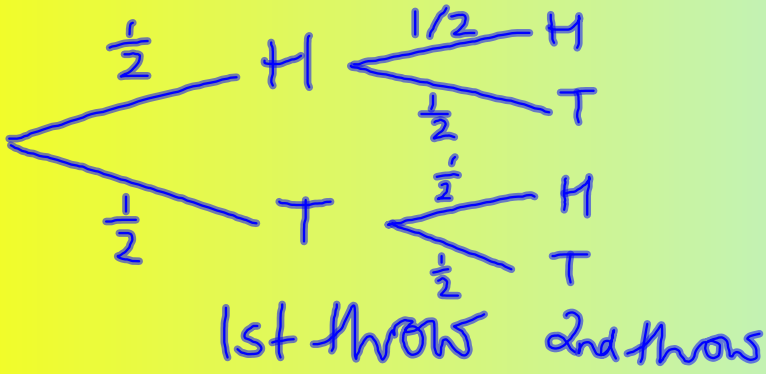
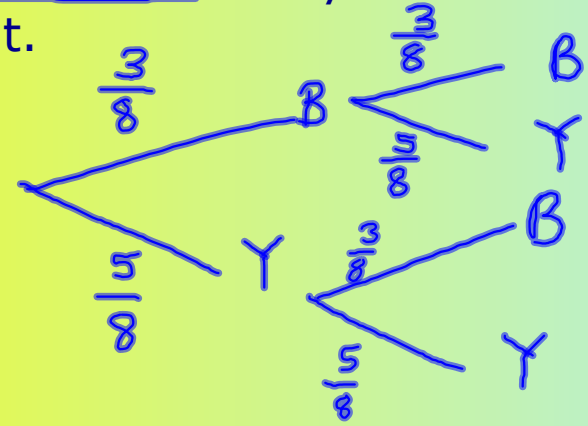
Probability tree diagrams

A tree diagram to show the outcomes of tossing two coins.



Draw a probability tree diagram to show the outcomes for withdrawing two beads, replacing the first after you have looked at it.



Attachments

fair or unfair.ppt.ppt